

Volume 1

**LOUISIANA
COASTAL NONPOINT POLLUTION CONTROL
PROGRAM**

**Coastal Management Division
Louisiana Department of Natural Resources**

prepared in cooperation and coordination with

**Office of Water Resources
Louisiana Department of Environmental Quality**

October 1995

Louisiana's Coastal Nonpoint Pollution Control Program

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CHAPTER I

STATUS SUMMARY

for the

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STATUS SUMMARY

In order to reduce the delivery of polluted runoff water from the land to coastal waters, Louisiana's Coastal Nonpoint Pollution Control Program, coordinated between many agencies and advisors, will ultimately 1) identify Best Management Practices (BMPs) appropriate for all applicable pollutant source categories, and 2) carry out initiatives of public education, technical assistance, and development of enforcement protocols in order to get BMPs implemented on the land.

WORK PLAN TASKS

Louisiana's Coastal Nonpoint Pollution Control Program (CNPCP) work plan, submitted to the National Oceanic and Atmospheric Administration (NOAA), and the Environmental Protection Agency (EPA), was approved in October, 1993. In order to achieve the goals and objectives of the 6217 program, Louisiana agreed to include the following elements in its coastal nonpoint pollution program:

- a.) Louisiana will identify nonpoint source categories and subcategories that impact coastal waters for which management measures will be implemented. It will include descriptions of and justifications for any proposed exclusions from such measures;
- b.) Louisiana will describe management measures to be implemented, including technical documentation for any alternative measures selected by the State of Louisiana for implementation;
- c.) Louisiana will describe procedures that the state will use to ensure implementation of the management measures, including operation and maintenance practices, inspection procedures, certification procedures, and monitoring;

- d.) Louisiana will identify land uses and critical coastal areas that may require additional management measures;
- e.) Louisiana's plan will describe any state-developed additional management measures that may need to be implemented to meet water quality standards and protect designated uses;
- f.) The plan will describe the state program that ensures implementation of all management measures and will designate the lead state agency for each source category and/or subcategory, describe the legal authorities to implement the management measures, and describe how the lead agency will implement the program;
- g.) Louisiana's plan will outline a schedule for full implementation of the management measures within eight years of federal approval and full implementation of additional implementation measures within thirteen years of federal approval.

The Louisiana Department of Natural Resources, Coastal Management Division (LDNR/CMD), was designated the lead state agency responsible for developing and implementing the CNPCP. LDNR/CMD, in close coordination with the Louisiana Department of Environmental Quality (LDEQ), as well as the Louisiana Department of Agriculture and Forestry (LDAF), the Louisiana Department of Health and Hospitals (LDHH), the Louisiana Department of Transportation and Development (LDOTD), the Louisiana Department of Wildlife and Fisheries (LDWF), the Louisiana Sea Grant College Program (LSGCP), and the Louisiana Cooperative Extension Service (LCES), will ensure that the program will be coordinated between state, federal and local governments. Technical assistance to local governments has been initiated during the program development process, and will increase during the implementation phase. This will enable local agencies to implement required parts of the CNPCP while providing opportunities for public participation in all aspects of the program.

The approved work plan for the CNPCP included eleven work tasks intended to be completed by the July, 1995 submittal date. **These tasks are delineated below.**

Task 1. Establish Interagency Coordination Mechanism

To coordinate the development of the CNPCP, LDNR established a Coastal Nonpoint Interagency Committee and five subcommittees, one for each of the five source categories of nonpoint pollution. There are fifty-six members on the Interagency Committee representing federal agencies (EPA, NOAA, USDA/ARS, USDA/CFSA, USDA/NRCS, USACOE, NMFS, BTNEP, USFWS, USGS); state agencies and statewide organizations (LDNR, LDEQ, LDAF, LDWF, LDOTD, LDHH, LDCRT, the Louisiana Cooperative Extension Service, the Louisiana Sea Grant College Program, Louisiana Farm Bureau Federation, Louisiana Forestry Association; local agencies and organizations (Bayou Lafourche Freshwater District, Lafourche Parish CZM program, Jefferson Parish CZM program, St. Tammany Parish CZM program, Lake Pontchartrain Basin Foundation, Citizens for a Clean Tangipahoa); landowners (Louisiana Landowners Association, Louisiana Land and Exploration, Vermilion Corporation, Continental Land and Fur, and Miami Corporation); industry (Louisiana Cattleman's Association, American Sugar Cane League, Vermilion Rice Growers Association, Boise Cascade, Georgia Pacific, and Marina and Boatyard Association of Louisiana). The committee is continuing to expand to include other interested members of the general public. The Interagency Committee and/or the subcommittees met monthly to coordinate all aspects of the development of the CNPCP. They will continue to convene, as needed, during the implementation phase of the program.

Task 2. Develop Ongoing Consultative Process with NOAA/EPA

Both NOAA and EPA were sent copies of meeting agendas, meeting dates, program updates and work documents produced during the development process. Copies of all contract deliverables were have received transmitted to the federal agencies, as well as providing them with quarterly progress reports. Both NOAA and EPA also were sent copies of the "informational" meeting documents prepared for the July 20, 1994 meeting on the boundary and the forestry sections of the CNPCP. And both agencies received copies of the threshold review documents prepared for the threshold review meeting February 22-23, 1995.

Task 3. Identify Categories and Subcategories of Nonpoint Pollution Sources which Significantly Impact Coastal Waters

The LDNR/CMD staff, in coordination with the Interagency Committee and all subcommittees, has reviewed the State's 305(b) reports, the 319 program and available data on nonpoint pollution from state and federal agencies, local governments, consultants, and universities. LDNR/CMD has reviewed land use data, making use of geographic information systems and other appropriate information sources, for determination of applicable categories and subcategories of nonpoint sources. The subcommittees have worked to identify programs and lead agencies for source categories and subcategories. Existing land use maps were examined to determine problem areas and to discuss impact effects, giving consideration to opportunities for funding, implementation challenges, local government participation, and potential for loss of critical areas. The subcommittees have identified categories and subcategories for proposals of exclusion from the program, and compiled the documentation for such exclusions. They have also identified gaps in information and recommended approaches to fill in these gaps.

Task 4. Establish 6217 Management Area

The LDNR/CMD staff and consultants, with substantial cooperation and support from LDEQ's Nonpoint Source Management Program and the Water Quality Inventory staff, evaluated the NOAA/EPA recommended boundary and compared it to the water quality maps indicating waterbodies meeting or not meeting their designated uses. Those subsegments not meeting designated uses due to nonpoint pollution sources were mapped utilizing LDNR/LDEQ GIS systems. Comparisons were made between the existing coastal zone and adjacent inland areas using available land use/land cover maps.

Task 5. Inventory and Assess Existing State Programs

The Interagency subcommittees began review of existing regulatory and nonregulatory programs early on in the program development process. Each subcommittee identified between nine and twenty-seven programs which could have relevance for the CNPCP. The first year contract with LSU Sea Grant Legal identified all the state laws, statutes, regulations, etc. that were applicable

to the CNPCP. For each program the subcommittees discussed jurisdictions, monitoring methods, enforcement capabilities, funding sources and areas of expertise. State and local agencies were contacted to bring to light any pertinent guidelines or regulations. Program gaps, such as subcategories or management measures which were not enforceable, were identified for each program. All programs were assessed for preexistence of BMPs, enforceable mechanisms, geographic and jurisdictional scope, and effectiveness of the program. Management measure worksheets were completed for each program to facilitate assessment and review. Gaps were then identified and modifications needed for implementation noted.

Task 6. Develop Strategy to Fill Gaps in Authorities to Implement Measures

To identify the gaps in state authorities needed to implement the necessary 6217 (g) measures LDNR/ a contract with LSU Sea Grant Legal. The contractors revisited the laws and statutes compiled under their previous contract, analyzed how existing legislation including program development could carry out the federal mandate, determined which of the (g) measures were not enforceable, and recommended new legislation to span any gaps. For agriculture, measures which are not clearly enforceable under current law include the following: erosion and sediment control; grazing; irrigation water; and nutrient management measure. Forestry management measures not enforceable under current Louisiana law include: preharvest planning, road management; timber harvesting; site preparation; fire management; revegetation in disturbed areas; streamside management areas; and road construction. All of the hydromodification management measures have enforceable policies. The five management measures under urban that are not currently enforceable under Louisiana law include the following: existing development; pollution prevention; watershed protection; operation and maintenance of on-site disposal systems; and management measures for roads, highway and bridge runoff. Marinas have the following management measures that are not enforceable under Louisiana law: stormwater runoff; fueling station design; boat cleaning; public education; boat operation; petroleum control; maintenance of sewage facilities; fish waste; liquid material; sewage facility; solid waste; and water quality assessment. Under the wetlands, riparian areas, and vegetated treatment systems section the only

measure determined to be not enforceable under Louisiana law is the vegetated treatment system measure.

Task 7. Initiate Identification of Problematic Land Uses and Critical Coastal Areas

To date the LDNR/CMD, in coordination with the LDEQ and the CNPCP subcommittees, have highlighted threatened or impaired coastal waters in Louisiana, and have begun to map these coastal waters for future planning. In addition, data collection has been initiated on population change and development trends in coastal Louisiana. The CMD intends to continue examination of covariation between patterns of land use and water quality assessments in and near the coastal zone. Although no formally designated critical areas are being proposed at this time, such areas are expected to be designated in the later phases of program development leading to implementation.

Task 8. Initiate Public Participation/Education/Outreach Efforts

During the development of Louisiana's CNPCP, time and resources have been invested in the promotion of public participation in the development process. Early on in the process, over 1500 EPA pamphlets were mailed out to recipients of the *Louisiana Coast Lines* newsletter to explain in general terms the nature of the program. The newsletter membership includes representatives of the news media, state and federal agencies, environmental organizations, industry and user groups, as well as legislators and municipal leaders, and concerned citizens. Updates in the bi-monthly newsletter have been included in every issue since summer of 1994, and each update offers a name and number to contact for more information. Through the CNPCP Interagency Committee and subcommittees, LDNR/CMD has communicated a willingness for CNPCP staff to speak at workshops, seminars, environmental gatherings, or other organization meetings, and staff members have addressed several audiences each month on the issues involved with the CNPCP. At local parish program meetings, updates are given on the status of the development of the CNPCP. A clause has been added in the FY94-95 parish contracts that the parishes, for coastal use permits deemed to be of local concern, must consider and evaluate BMPs to minimize nonpoint source impacts. Through a contract with the Louisiana Cooperative Extension Service

(LCES) consultants developed slide presentations on each of the source categories of nonpoint pollution occurring in Louisiana as well as an overview set. These presentations have been extensively utilized at seminars, workshops, and other meetings. The LCES contract also required coordinating, advertising, and facilitating a series of four regional meetings designed to explain the CNPCP to the public and solicit their comments and input. Although not well attended by the general public, many state and federal agency representatives were in attendance. During FY94-95 a contract with LCES will require another series of regional meetings, with these being geared to industry and user groups. This contract will also require LCES to design a series of pamphlets on the nonpoint sources and the BMPs the program will promote, as well as design a logo and poster for general distribution to the public. Finally a 15-20 minute videocassette (VHS) will be developed explaining the CNPCP, and five hundred fifty (550) copies made for distribution to schools, organizations, user groups, and all affected parties. Memoranda of agreement will also be offered to sixteen federal and state agencies and/or organizations, each of which requests the agency to educate its staff, contractors and agents on the provisions of the CNPCP to ensure compliance. Articles updating the development of the CNPCP are written periodically for other agency newsletters and other public information vehicles. A diversity of avenues for public education/outreach will be explored throughout the implementation process.

Task 9. Initiate Technical Assistance Program for Local Governments and the General Public

The LDNR/CMD staff have made efforts to keep local governments abreast of meetings and findings of the CNPCP Interagency Committee and its subcommittees. Updates on the status of the program's development, through articles written in CMD's bimonthly newsletter, are routinely received by all coastal parishes. At advisory committee meetings of parishes with approved local coastal programs the development of the CNPCP is routinely addressed. Several of the parish CZM staff sit on one or more of the subcommittees. Status reports are routinely given at local government functions, hearings and committee meetings. At the quarterly local program meetings held in LDNR, committee and subcommittee reports are presented and input is requested. It is anticipated that one or more workshops for local program personnel will be held, once the

program is approved and implementation begins, as but one element of an on-going process of technical assistance.

Task 10. Identify, Modify or Develop Additional Management Measures or Process to Identify Additional Management Measures for Problematic Land Uses and Critical Coastal Areas

The LDNR/CMD and the CNPCP committees and subcommittees CNPCP have reviewed all management measures proposed for implementation, and expect to continue to meet in the coming months to further develop and refine the program. Program elements requiring further development include a more complete elaboration of monitoring strategy, and designation of critical coastal areas. Some time after these elements are developed, and implementation of basic measures has begun, would the need for any additional management measures become clearer. Shortcomings or gaps in information, authorities, public outreach efforts, and technical assistance will continue to be addressed. Ongoing data analysis will help to bring into focus any need for additional management relative to critical coastal areas and particularly problematic land uses.

Task 11. Initiate Development of 6217 Program Document and EA/EIS Information for NEPA Process

Louisiana's 6217/CNPCP threshold review document was submitted to NOAA/EPA on January 11, 1995, and serves as a framework for building Louisiana's 6217 Coastal Nonpoint Pollution Control Program document. An intermediate draft document was circulated for thirty days of public review and comment in May/June of 1995. With public review comments attached, Louisiana's CNPCP program document is herewith submitted for federal review. Louisiana reviewers expect to work with federal counterparts to assist with NEPA EA/EIS development as further guidance is communicated.

CONTRACTS

The CMD has entered into a variety of contracts with a wide range of contractors throughout the development of the CNPCP. Scopes of services ranged from reviewing agency BMPs vis-a-vis the CNPCP, to preparing legislation and supplementary regulatory mechanisms to help ensure implementation of the program. Interagency committees and subcommittees have been provided the opportunity to comment on contract scopes of services and deliverables. Scopes of services for each of these contracts is discussed below.

FY 92-93 Projects

1.) Louisiana Department of Agriculture and Forestry - This contract consisted of a review and analysis of measures and practices for the control of nonpoint pollution by the agriculture and forestry industries in the western portion of Louisiana's coastal zone. Deliverables included a report analyzing and evaluating all current BMPs being employed by the agriculture and forestry industries, an economic feasibility analysis on all appropriate management measures, an identification of alternative measures which may be implemented, and a recommendation as to the form and content of the 6217 program. It also included some land use analysis and identification of potential areas impacted by the CNPCP, including numbers of acres devoted to forestry and farm production by crop type, as well as an estimation of number of acres that may require further implementation of BMPs. The contract was completed as of June 30, 1994.

2.) LSU Sea Grant Legal - This contract consisted of a broad analysis and compilation of existing Louisiana law and other authority to determine to what extent existing laws can serve as enforceable policies for the CNPCP. The review covered all levels of government and all types of authority. Nontraditional approaches to improving coastal water quality were also reviewed, including incentive programs. This survey by legal professionals indicated that many of the management measures to be addressed by the CNPCP do not have enforceable mechanisms in Louisiana. **While this effort indicated that a legislative mechanism might be a reasonable approach to dealing with these gaps in enforceable mechanisms, the LDNR through**

discussions with the LDEQ has agreed to pursue non-legislative solutions to address these gaps at this time. This contract was completed in March, 1994.

3.) Louisiana Cooperative Extension Service - The contractor developed materials for informational audio/visual presentations on the CNPCP, including an overview and one for each of the five sources of nonpoint pollution to be addressed in the program. The visual component of the presentation materials developed by the contractor included slide sets, large format photographs for booth displays, and other graphics. As part of the public information responsibilities specified in the contract, LCES set up and facilitated four regional CNPCP meetings held in May, 1994, carrying out publicity initiatives to announce the dates, locations and purpose of the meetings. The contract was completed in June, 1994.

4.) Jefferson Parish - The Jefferson Parish CZM program staff developed a survey checklist to complete during site inspections of service stations and construction sites less than five acres in size in order to identify potential sources of contaminants in stormwaters. The deliverable document included recommended corrective measures to reduce the contaminant levels and identified programs, ordinances and measures to achieve implementation of BMPs. A total of thirty service stations and automotive repair shops were inspected utilizing the checklists along with twenty construction sites. The results of the surveys were then transmitted to all coastal parishes for their information and use. The contract was completed in June, 1994.

FY 93-94 Projects

1.) Louisiana Department of Agriculture and Forestry - This contract had a similar scope of services and deliverables as the LDAF contract for the previous year, FY 92-93, but in FY 93-94, the geographic focus of study shifted to the eastern half of Louisiana's coastal zone. This contract was completed in November, 1994.

2.) LSU Sea Grant Legal - This contract required the contractor to review all information and data obtained in the previous statute compilation project, analyze how existing legislation including

program development can control nonpoint source pollution, determine which of the (g) measures are not presently enforceable, and recommend new legislation to span any gaps in regulatory coverage. As previously mentioned in Task 6, many of the measures were determined not to have enforceable mechanisms. Recommendations were made as to what regulatory mechanisms could be installed to make these management measures enforceable. The contract also called for drafting of legislation to be presented to the Louisiana Legislature, creating and defining the Louisiana Coastal Nonpoint Pollution Section within LDNR, listing its powers and duties, creating the Coastal Nonpoint Pollution Advisory committee, specifying the 6217 management area boundary, providing a Coastal Nonpoint Pollution Fund, adopting the (g) measures in EPA's guidance document and any additional measures as necessary, creating a Coastal Nonpoint Pollution Control Program compliance mechanism, with guidance for developing a site-specific conservation plan for corrective measures, creating the authority to issue corrective orders, the appeals process, the process for imposing penalties, injunctions and other legal actions, creating a Nonpoint Pollution Water Quality Fund, and establishing the coordination mechanism required with other state agencies. The draft report was received in December, 1994 and is currently under review.

3.) Rod E. Emmer and Associates - This contract required the contractor to facilitate the coordination of the development of the CNPCP with LDEQ, as required in the reauthorization amendments. Dr. Emmer has assisted LDNR in reviewing the land-use and water quality impairment GIS data base and documentation at LDEQ, and transferring the appropriate data to LDNR's GIS data base. The contractor has prepared the rationale and documentation for the recommendation of the 6217 management area, updating the data throughout the contract period. The contractor reviewed LDEQ's public participation/outreach plans and made recommendations for coordination with the CNPCP. Dr. Emmer drafted the memoranda of agreement that are envisioned to be negotiated between LDNR, and various federal and state partner agencies with whom LDNR expects to formally coordinate. Finally, the contractor has attended virtually all of the subcommittee meetings to provide input and offer technical advice and assistance. This

contract was completed as of December 31, 1994 but LDNR/CMD has contracted again with R. E. Emmer and Associates for the period, January 1 through June 30, 1995.

FY 94-95 Contracts in Development

1.) Rod E. Emmer and Associates - Dr. Emmer will continue to work closely with, and to coordinate between LDNR and LDEQ, as well as other state and federal agencies. The contractor will facilitate communications to ensure that all parties are informed of the other's programs and approaches to reducing nonpoint source pollution, review subcommittee reports for consistency, content and compliance with NOAA/EPA directives, and will assist CMD staff in preparing the state's CNPCP document.

2.) Louisiana Cooperative Extension Services - The LCES will assist CMD by targeting specific inland user groups as well as the general public in disseminating public information. They will schedule, publicize and facilitate a series of regional outreach programs to contact more of these groups. The contractor will develop a video (with 550 copies), design a logo, design a poster, and design a series of technical brochures to heighten public awareness of, and to promote public participation in, the development and implementation of the CNPCP.

3.) Louisiana Department of Health and Hospitals - The LDHH will draw upon its public health expertise in reviewing management measures, practices and local guidelines relating to sewage treatment and disposal. They will develop a computer system to facilitate the tracking of inspections and maintenance of commercially installed mechanical treatment systems, as well as prepare public service spots for television to help inform consumers of their role in reducing pollution. The LDHH will survey agencies and institutions and compile alternatives for individual wastewater treatment systems. Finally, they will identify and evaluate potential demonstration projects, exploring specific sewage treatment alternatives such as state-of-the-art mechanical plants, bioconversion composters, sand filters and chlorine alternatives.

4.) Louisiana Department of Agriculture and Forestry - The LDAF will review and update agricultural and silvicultural management measures and BMPs identified as significant for coastal Louisiana. They will begin to formulate additional management measures to fill in the gaps in coverage and will identify all pertinent BMPs associated with such measures. Thirdly, they will help identify critical coastal areas and problematic land uses concerning nonpoint pollution problems attributed to agriculture and forestry activities.

To work with LDNR/CMD in bringing about the implementation of CNPCP BMPs, through coordination of both voluntary and regulatory programs, the LDNR/CMD proposes to work out memoranda of agreement with sixteen federal and state agencies or programs. It is envisioned that the partner agencies would include the following:

- 1.) U.S. Army Corps of Engineers - New Orleans District
- 2.) U.S. Army Corps of Engineers - Vicksburg District
- 3.) U.S. Army Corps of Engineers - Galveston District
- 4.) U.S. Fish and Wildlife Service
- 5.) National Marine Fisheries Service
- 6.) U.S. Coast Guard - New Orleans District
- 7.) Barataria-Terrebonne National Estuary Program
- 8.) U.S. Department of Agriculture-Consolidated Farm Services Agency
- 9.) U.S. Department of Agriculture-Natural Resources Conservation Service
- 10.) Louisiana Department of Culture, Recreation and Tourism
- 11.) Louisiana Department of Transportation and Development
- 12.) Louisiana Department of Wildlife and Fisheries
- 13.) Louisiana Department of Health and Hospitals
- 14.) Louisiana Department of Natural Resources - Office of Conservation
- 15.) Louisiana Department of Environmental Quality
- 16.) Louisiana Cooperative Extension Service

The LDNR/CMD is presently in process of clarifying existing authorities and responsibilities of partner agencies involved in the development of the CNPCP, and negotiating an articulation of each agency's role in monitoring and enforcing the CNPCP, within the constraints of each agency's mandate. It is the expressed intention of LDNR/CMD that any new tasks envisioned for partner agencies should *not* represent a significant departure from, nor significant addition to, existing duties of the partner agency. No partner agency will be expected to accept additional responsibilities for the implementation of the CNPCP unless a corresponding proportion of resources from external sources is made available to the partner agency. While the federal government has designated that the LDNR/CMD should be the lead agency for the CNPCP, the LDNR/CMD intends no usurpation of the authority of any fellow partner agency, and any reports to be filed to the coordinating agency, LDNR/CMD, are viewed as information exchanges between co-equals for the mutually beneficial conservation of Louisiana's natural resources. It is in this spirit that the LDNR envisions the negotiation of mutually acceptable memoranda of agreement (MOAs) that will spell out appropriate roles for LDNR/CMD and for each partner agency involved.

In summary, Louisiana's CNPCP began to coalesce with the sketching out of its work plan. The CNPCP Interagency Committee and its various subcommittees came together, evaluated source categories and subcategories of nonpoint source pollution that could impact coastal waters, evaluated applicability of all management measures and much of the BMPs, and have begun to lay out a plan that the State of Louisiana would follow to ensure implementation of the management measures. Contractors have developed critical portions of the program. All major laws concerning nonpoint pollution were identified and compiled by LSU Sea Grant Legal and were included in the threshold review document. Public outreach has been facilitated in the early stages of this program development by contractors. Public participation has been sought and encouraged during the development of the CNPCP utilizing various media resources, and the public will continue to be afforded opportunities to participate during the refining and implementation of the program. Consultants have facilitated interagency coordination and

exhaustively researched the varied aspects of the management area boundary issue, with the result that Louisiana recommends that the existing coastal zone boundary and the 6217 management area inland boundary should be the same. Discussions are ongoing regarding clarification of the partner agencies' authorities, responsibilities, and the roles that they are envisioned to play in the implementation of this program. Monitoring strategies are sketched out in Chapter III of this volume, including some projected agency responsibilities and reporting procedures, but this part of the program will need to be more completely elaborated in the coming months. Discussion of designation of "critical coastal areas" has been initiated in the five subcommittees and the issue is under study by contractors. It is anticipated that designation of such areas would take place in the next 12-18 months. The need for additional management measures will be considered by the subcommittees through the monitoring period. Finally, the only exclusions requested for Louisiana's Coastal Nonpoint Pollution Control Program concern the forestry source category, and the dams management measures in the hydromodification section of the program.

CHAPTER II

AN INLAND BOUNDARY FOR THE LOUISIANA 6217 MANAGEMENT AREA

for the

LOUISIANA

COASTAL NONPOINT POLLUTION CONTROL PROGRAM

Coastal Management Division

Louisiana Department of Natural Resources

prepared in cooperation and coordination with

Office of Water Resources

Louisiana Department of Environmental Quality

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Rod E. Emmer, Ph.D., Rodney E. Emmer & Associates, Inc., Baton Rouge, La. compiled the document under DNR Contract No. 25104-94-04.

*Louisiana's Coastal Nonpoint Pollution Control Program****AN INLAND BOUNDARY FOR THE
LOUISIANA 6217 MANAGEMENT AREA*****II. INTRODUCTION**

In 1990, Congress passed the Coastal Zone Act Reauthorization Amendments (CZARA). States needed to determine if the existing regulated coastal zone extended sufficiently inland to control those land and water uses that, individually or cumulatively, have a significant impact on a state's coastal waters. Within this area, states are expected to implement those measures developed under Section 6217(g) to meet the CZARA goals. In an independent effort, the National Oceanic and Atmospheric Administration (NOAA) in consultation with the Environmental Protection Agency (EPA) recommended that the inland boundary for this area, commonly known as the 6217 management area, be north of the existing Louisiana coastal zone (Figure II-1). The 6217 management area corresponds to the coastal watershed boundaries (U.S. Geological Survey Cataloging Units) for waterbodies draining into Louisiana coastal waters (even though these boundaries do not accurately depict the watersheds) and encompasses the head of high tide. It is NOAA's position that watersheds provide logical physical units when dealing with nonpoint source pollution. Louisiana, on the other hand, believes existing physical and cultural barriers segmenting the deltaic and chenier plains **negate** the importance of the watershed for dealing with nonpoint pollution.

The federally proposed 6217 inland line is a starting point for further discussions with Louisiana and for the eventual establishment of a boundary. Louisiana makes the final determination of the location of the 6217 boundary. With this in mind, Louisiana has undertaken its analysis using existing information and data and building on agency and scientific expertise, particularly within the Department of Environmental Quality, to determine where the inland boundary for the nonpoint pollution program should extend. The analysis is based on the criteria recommended by NOAA (Maloney 1993) for establishing a boundary:

II-2

Figure II-1

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
3. Information describing the physical characteristics of an area, such as slope and soil composition, and analysis of how these characteristics affect nonpoint source (NPS) pollution creation and delivery to coastal waters.
4. Information related to transport characteristics such as distance from coastal waters, stream order, time of travel, and fates and effects.
5. Combinations of environmental data to produce a rating scheme or pollution potential analysis.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

The rationales (Maloney 1993) of most relevance to Louisiana focus on a source having or not having a significant impact on coastal waters; an areas isolation from coastal waters; and the effectiveness of management regimes in controlling nonpoint source pollution. Maloney (1993) indicates the acceptable types of supporting data (emphasis added):

monitored water quality data;
 biomonitoring information;
 water quality information from **305(b) reports**;
319 assessments;
 detailed hydrologic unit maps;
 dam locations;
 information on other types of diversion/retention structures;
 maps on existing and projected land uses; and
 identification and analysis of existing management/legal framework.

Using the above referenced and recommended NOAA criteria, rationale, and types of supporting data, Louisiana has determined that it will use the existing coastal zone demarcation established by Act 361 of 1978 for defining the inland boundary of the 6217 management area. This line occurs as far north as necessary to control sources of nonpoint pollution that, individually or cumulatively, significantly impact Louisiana's coastal waters. The impact areas or areas of concern are coastal waters which by definition have "a measurable quantity or percentage of sea water", that is, the wetlands south of the fresh marsh (Figure II-2). The presentation of Louisiana's approach to coastal nonpoint pollution control begins with a review of the natural regions of the state, identification of the existing watersheds as modified by human activities (federal public works projects), and a discussion on the status of water quality. Second, the development of Louisiana's coastal zone management program and interagency coordination procedures are discussed. Third, the report describes and discusses the coastal setting in relation to nonpoint pollution issues. Finally, Louisiana presents its boundary for delineating the 6217 management area.

FIGURE II-2

IIA. DESCRIPTION OF THE 6217 MANAGEMENT AREA

In addressing the issues that are important when dealing with nonpoint pollution, the reader must understand and have an appreciation for the physical, biological, and cultural systems found throughout south Louisiana. These factors may seem obvious to the person familiar with Louisiana, but to someone with no background in an alluvial and deltaic coastal system it is an essential introduction and gives them a feeling for the region. This section serves as a common base for everyone for planning.

Louisiana may be divided into four natural regions (Newton 1972): the hills of north Louisiana; the Red River and Mississippi alluvial valleys; the terraces that in southwest Louisiana encompass the prairie and flatwoods and in southeast Louisiana the blufflands and flatwoods; and the coastal zone (Figure A-1). The units of interest in this report are the Mississippi alluvial valley from Old River south; the terraces on both sides of the alluvial valley; and the coastal zone. The coastal zone may be further divided into the Mississippi River deltaic plain and the chenier plain. Each of these units is described in the following sections.

Chenier Plain

The Chenier Plain of southwest Louisiana is a predominantly marsh lowland that is segmented by a series of abandoned shorelines, the cheniers (Figure A-2). A chenier's origin is related to the position of the mouths of the Mississippi River. With Mississippi River discharge along the western side of the deltaic plain mudflats formed on the Gulf shoreline between Atchafalaya Bay and Galveston Bay. When the main channels shifted farther east, the mudflats eroded and beach ridges were formed. This cyclic advance and retreat of the shoreline has continued since sea level reached its present stage. Elevations may reach a maximum of 12 feet on the crest of these stranded beach ridges. Typical of beaches, the backshore is flat (12 feet high and a width of 700 plus feet). In the Creole Ridge complex, the closely spaced accretionary ridges are 4,500 feet

IIA-2

Figure A-1

Figure A-2

IIA-4

wide and attain a maximum elevation of only four feet. The steepest slopes are the south facing foreshore where local relief may be 10 to 12 feet. (Gould and Morgan 1962). Interior marshes are essentially flat and range in elevation from less than five feet above mean sea level at the Pleistocene/Recent contact to sea level near the shoreline. Natural vegetation on the cheniers is a live oak association on the higher elevations and grasses on the lower, inland side. Marshes between the ridges are fresh to saline and serve as valuable coastal habitat.

Three major rivers cross the Chenier plain: the Sabine, forming the Texas-Louisiana state boundary; the Calcasieu; and the Mermentau. The Sabine and Calcasieu Rivers are artificially maintained through dredging and jetties by the U.S. Army Corps of Engineers for international commerce and support the petroleum industry in the Gulf. The Mermentau River was excavated to support the outer continental shelf industries (Emmer 1990). Runoff from adjacent uplands reaches the coastal marshes and flows across them until obstructed by the cheniers. The water then moves to the three primary rivers. The greatest natural hazard threatening the coast is hurricane storm surge. During the worst of storms almost the entire coastal zone will be inundated with as much as 18 feet of water.

Human occupancy is restricted to the cheniers and isolated Pleistocene outcrops. The major highways are on the cheniers or fill when the roads cross between cheniers. Pecan Island, Grand Chenier, Mermentau, Cameron, and Holly Beach, as well as several recreational communities, are all found on the cheniers. Water dependent industrial development, for example, support the OCS as supply bases along the Calcasieu River at Cameron and on the Mermentau River at Mermentau. The result is a concentration of industrial, commercial, and residential activities on the only ground suitable for intensive development. To give some idea of the limited extent of these available lands, that is the cheniers, the Natural Resource Conservation Service estimates that only 6.9 percent of Cameron Parish has soils characteristic of cheniers. This is 100 miles² of a possible 1444 miles².

Mississippi River Deltaic Plain

East of the Chenier plain is the Mississippi River deltaic plain (Figure A-3), a broad, low expanse of coastal wetlands and natural levee ridges owing their existence to the dynamic processes of a prograding delta building onto a shallow continental shelf (Gagliano and van Beek 1970). A series of sedimentary lobes migrated east and west from Mississippi to south central Louisiana creating meander belts of natural levees and filled channels. Sediments (clays, silts, and sands) are a resource because they are the primary building block that created the coastal zone. Elevations are highest along the crest of the natural levees near the channels and decrease in a downstream direction and as one progresses into the adjacent basins. For example, at Vacherie, the natural levees are 15 to 18 feet high and 3.5 miles wide while in New Orleans, the crest of the natural levee ranges between 10 and 12 feet and slopes to approximately sea level at a distance of two miles (less than one percent slope) (Emmer and Day 1976; Kemp 1967; Kolb and van Lopik 1958). Figure A-4 shows a schematic of a natural levee. Soils on the levees are predominately sands with silts closer to the channels. As the swamps are approached a transition occurs to clays and clays high in organic material. The natural levees are the least susceptible to floods because they are high and in most places protected by either hurricane protection levees or river levees and an elaborate and expensive network of pumps. Storm surge, which may reach 18 feet, is a severe problem nearest the Gulf.

Between meander belts are estuaries or intertributary basins of bottomland hardwoods, cypress swamps, marsh (Figure II-2), and lakes (Roberts 1986; Gagliano and van Beek 1970). The landscape is virtually flat with elevations below five feet mean sea level at the inland extreme of the estuaries (50 or more miles from the Gulf of Mexico) to at or near sea level in the coastal bays. Soils are clays rich in organic material or, in some areas peat, both of which shrink and subside when drained. Sands with a shell hash form the barrier islands and beaches facing the gulf. Natural water movement is across the natural levees which flood into the cypress swamps and marshes. Within the basins sluggish bayous lead to quiet lakes, natural hydrologic systems characteristic of the estuarine environment. The hydrology has been significantly modified by

IIA-6

Figure A-3

Figure A-4

Corps of Engineers' flood control levees on both sides of the Mississippi River, navigation channels such as the Houma Navigation Canal, the Barataria Waterway, and the Mississippi River Gulf Outlet that go through the heart of an estuary, and linear features, for example, access canals for oil, gas, and sulphur operations, road beds, and spoil banks that are everywhere. The coastal landscape has changed dramatically during the last 150 years.

Historically, intensive development was voluntarily restricted to the natural levees along the major watercourses (Davis and Place 1983). The industrial corridor on the natural levees of the Mississippi River in Plaquemines Parish display a characteristic evolution of economic expansion. Towns grew on the highest part of the natural levees while adjacent lower levees were cleared for agriculture. Bayou Lafourche, from Donaldsonville to the Gulf of Mexico is known as the world's "longest street", a reference to the importance of the bayou for communication, transportation, and the focus of economic life. However, as pumps got larger, better equipment became available to build levees, and populations grew, development expanded from the levees into the adjacent swamps and marshes (Emmer and Davis 1987). This is particularly true in New Orleans and along the Mississippi River south of the city; in lower Lafourche Parish where towns are protected by levees; throughout Terrebonne Parish where drainage districts exist or are proposed; and in the Patterson, Berwick, Morgan City, and Amelia area.

Industry and commercial water-oriented activities crowded the banks of the rivers and bayous, seeking access to deep water for docks, maintenance facilities, and berths. Yards for the construction or repair of commercial boats and supply bases crowd next to each other on Bayou Lafourche, Bayous Boeuf, Black and Chene near Morgan City, and the many watercourses south of Houma. Runoff goes into the bayou and eventually to the Gulf. Navigation canals attracted industry, especially the Houma Navigation Canal and the Gulf Intracoastal Waterway. Both here and in the Chenier plain the people have a history of living close to the water and keeping their boats and industries intermingled with their house and commercial areas. Thus, small boat repair facilities are on narrow strips of land adjacent to bayous and next to or across the road from

where they live. Agriculture centers on sugar cane, especially in the Barataria-Terrebonne basins and St. Mary Parish.

Pleistocene Terrace

North of the Chenier plain and the Mississippi River deltaic plain are the Pleistocene terraces. Geologically, these surfaces are older duplicates of the present coastal systems. The primary differences are that the Pleistocene has been uplifted, weathered, and slightly tilted to the south during the past 20,000 years. Now even though the terraces are flat the elevations range from approximately five feet above sea level to 300 feet and more farther inland near the Mississippi stateline. Blufflands have moderate to marked relief (Newton 1972) which in some cases appear as valleys more than 100 feet deep. Flatwoods are broad and tabular with low relief except along incised streams and moderate elevation while the Prairies of southwest Louisiana are flat surfaces with low relief and elevation (Newton 1972). Bernard and LeBlanc (1965) present information developed by H.N. Fish on the regional seaward slopes of mapped terraces: Williana - 9.2 feet/mile; Bentley - 4.3 feet/mile; Montgomery - 2.9 feet/mile; and Prairie - 1.2 feet/mile. Soils are silt loams and clays. A dendritic pattern characterizes the drainage network. Rivers, creeks and bayous eroded channels which have distinct valleys as opposed to the meandering watercourses of the Chenier plain and deltaic plain. Flooding is primarily caused by precipitation and overbank flow rather than by hurricane storm surge.

Prairie grasslands once dominated the western terrace, but this region has been converted to crops, primarily rice. Deciduous forest grows in the river valleys that dissect the terraces. In the east are the coniferous and mixed forests, again with the deciduous forests in the river bottoms.

Urban and industrial development is concentrated around Lake Charles, Lafayette, and Baton Rouge, and in St. Tammany Parish. The latter, on the north shore of Lake Pontchartrain, is a bedroom community for New Orleans.

Mississippi River Alluvial Valley

The Mississippi River alluvial valley extends from Cairo, Illinois to an imaginary line between Franklin and Donaldsonville, Louisiana. This line marks the southern limits of the confining valley walls formed by the older geologic formations. Several Mississippi River meanderbelts occupy the valley, separating vast bottomland hardwood forests and low cypress swamps. Elevations are highest in the north and decrease to the south and away from the river channels. Slopes are generally less than one percent with the steepest slopes (up to eight percent) on the present Mississippi River natural levees (Schumacher et al. 1988). Soils grade from sands near the channel to silts and eventually clays in the swamps. For the most part, the natural levees have been cleared of native vegetation for agriculture and towns.

Regional hydrology is controlled by levees, canals, and pumps. Corps of Engineers flood control levees prevent Mississippi River floodwaters from entering the intertributary basins. In the basin standing water covers broad swamps much, if not all, of the year. Braided channels drain the interiors toward the Gulf of Mexico. Canals, road embankments, and spoil banks compartmentalize the landscape and have significantly modified the hydrology. The Atchafalaya River has been confined by Corps of Engineers' levees to create the Atchafalaya Floodway. Water in the floodway is derived from the Mississippi and Red Rivers, with the former being by far the dominant source. Corps of Engineers' control structures at Old River limit flow in the Atchafalaya to 30 percent of Mississippi River discharge (Martinez and Haag 1986). Pollutants originate from the Mississippi River (Atwood 1992; Office of Technology Assessment 1987a). In other words, water quality and volume are a direct result of the flow and suspended and dissolved material in the Mississippi River. Atchafalaya River water moves through the Teche-Vermilion Freshwater Diversion project to augment low flows on Bayou Teche and the Vermilion River and to supply water for irrigation.

Municipalities are on the highest ground adjacent to the Mississippi River. The greatest industrial concentration is along the Mississippi River south of Baton Rouge where much oil and gas is

processed or manufactured into the many petroleum products that are found in modern society.

River basins and ecoregions

For planning and management purposes, the Department of Environmental Quality has superimposed onto the natural regions twelve major natural river basins (Figure A-5) (Office of Water Resources n.d.) known as water quality management basins and ecoregions. From west to east the major water quality management basins are:

RIVER BASIN	BASIN NUMBER
Sabine River	11
Calcasieu River	03
Mermentau River	05
Vermilion-Teche River	06
Atchafalaya River	01
Terrebonne	12
Barataria	02
Lake Pontchartrain	04
Pearl River	09

Within each water quality management basin smaller watersheds have been mapped and numbered as segments. Hydraulic and water quality characteristics are fairly constant within each segment and are the basis upon which segment boundaries were established. Segments within each river basin are identified by the addition of two numbers to the right of the basin number. Subsegments are assigned two numbers to the right of the segment number. For example, the larger Lake Pontchartrain basin (04) is divided into several segments or smaller basins, such as the

IIA-12

Figure A-5

Tangipahoa River with a discrete number 07. The number for the entire Tangipahoa River then is 0407. However, the Tangipahoa River basin can be divided into three subsegments: 01 - the Tangipahoa River from the Mississippi State Line to Interstate Highway I-12; 02 - the Tangipahoa River from Interstate Highway I-12 to Lake Pontchartrain; and 03 - Big Creek and Tributaries. Thus if one is interested in knowing the water quality of that part of the Tangipahoa River north of I-12, the correct reference is 040701. Water quality for the subsegments is described in the 1994 Section 305 (b) report (Office of Water Resources 1994) prepared in accordance with EPA Guidelines (EPA 1993b). In addition to using subsegments for water quality management, the Department of Environmental Quality is developing and applying an "ecoregion" approach to water quality management. Louisiana is building on the concepts proposed by the Environmental Protection Agency's Corvallis Research Laboratory (Gallant et al. 1989). National ecoregions based on geographical, geological, biological, climate, land use, vegetation, and hydrological characteristics as modified by human institutions and projects were identified to benefit the management of water resources within areas of similar ecological characteristics. The DEQ is refining the EPA proposal by incorporating significant human impacts to the state's hydrology, such as the Mississippi River flood control projects, the Atchafalaya floodway guidelevees, navigation channels, and water control structures essential in coastal wetlands (University of Southwestern Louisiana 1994). The DEQ is currently evaluating the potential application of an ecoregion approach to water quality management. To date no decision has been made on when or if the ecoregion approach will be incorporated into the state's water quality programs.

II B. THE EXISTING COASTAL ZONE MANAGEMENT PROGRAM AND THE EXISTING LOUISIANA COASTAL NONPOINT POLLUTION CONTROL PROGRAM

The Coastal Zone Management Program

Act 35 of 1971 was Louisiana's first attempt to deal with its coastal problems. Act 35 established a nine-member Advisory Commission on Coastal and Marine Resources, and required studies of the problems in the coastal zone, preparation of annual reports to the governor, and the development of a coastal zone management plan (Louisiana Advisory Commission on Coastal and Marine Resources 1972). To meet its needs for a study area the Advisory Commission proposed the coastal zone as that region of the state south of U.S. Highway 190 (U.S. 190 parallels and is for the most part north of I-10 and I-12 from Texas to Mississippi).

In 1973 the Commission's first attempt at a coastal zone management plan (Louisiana Advisory Commission on Coastal and Marine Resources 1973) suggested that the coastal zone include the 26 southern parishes. The State Planning Office which at that time was overseeing the Louisiana coastal effort contracted with the Center for Wetland Resources, Louisiana State University (LSU) for the development of a rationale for determining the inland boundary. LSU decided to approach the boundary issue by investigating the biophysical setting of south Louisiana. As a result of its studies the Center produced Report No. 1 (McIntire et al. 1975) of what was to become an extensive series on the physical, biological, and cultural systems of the coastal zone. Twenty-one biophysical parameters were selected, such as Pleistocene/Recent contact, elevation, soils, vegetation, 100-year flood plain, salinity, and the distribution of selected marine fish, mammals, reptiles, and birds. Professional reports, studies, documents, and maps were collected and the material compiled into a brief text and maps to help correlate the parameters. Finally, after all the material was assembled, a best-fit line was created. The demarcation, approximating the contact of the Pleistocene/Recent geologic surfaces, is very close to the five-foot contour on

IIB-2

topographic maps. The boundary trends west to east, except where the line turns sharply north to include the Atchafalaya basin, thus forming a physical and biological coastal zone.

But the biophysical approach to defining the inland boundary was subject to much debate. Coastal zone management initially had little legislative support and what interest existed aimed to take advantage of the funding possibilities and the federal consistency provisions (General Accounting Office 1976). When it came to defining a coastal zone it seemed that almost everyone had an opinion as to where the inland boundary should be placed. Some supported the LSU report and favored the five-foot contour as appropriate for delineating the coastal zone. But formidable opposition surfaced and made a strong effort to place the line within three miles of the Gulf of Mexico shoreline, thus including a minimal wetlands zone in the state coastal management program (OCZM and CMS 1980).

The Final Environmental Impact Statement (FEIS) for the Louisiana Coastal Resources Program (OCZM and CMS 1980) serves as the authority for regulating coastal activities through coastal use guidelines. Act 361 (the State and Local Coastal Resources Management Act of 1978) prescribed the lateral boundaries of the coastal zone as the Texas and Mississippi state lines and the federal Outer Continental Shelf as the seaward limit. The inland boundary is a compromise between several locations proposed and evaluated during the formulation of the Louisiana coastal program (OCZM and CMS 1980). A legal description of the inland boundary appears on Figures II-1, and B-1). Louisiana's coastal zone is large, encompassing approximately 5.3 million acres. It varies in width from six miles in the center of the state (line 6, Figure B-1 and Table B-1) to 98 miles (Line 12, Figure B-1 and Table B-1). The average width of the coastal zone as determined from the 15 lines shown on B-1 is 28 miles.

What has been described is the legal and federally approved inland coastal zone boundary for Louisiana. However, Act 361 promulgated a second line of demarcation, the "permit line". This second boundary is based on two criteria: the five-foot contour and the existence of publicly owned levees {La. R.S. 49:213.15 A.(1) and (2)}. First, if a proposed activity will take place wholly on lands above five feet mean sea level (MSL) then the state has very little permitting

Figure B-1

IIB-4

Table B-1. The Width of the Louisiana coastal zone. The average length of the 15 lines is 28 miles. (Refer to Figure B-1 for line locations)

LINE	DESCRIPTION	WIDTH
1	Texas-Louisiana Stateline	22 miles
2	Calcasieu Lake	23 miles
3	Gibbstown	12 miles
4	Cameron-Vermilion Parish Line	23 miles
5	Forked Island	21 miles
6	Weeks Island	6 miles
7	Below Franklin	13 miles
8	Below Morgan City	33 miles
9	Below Houma	33 miles
10	Lake Salvadore	36 miles
11	Below Convent	60 miles
12	Below Denham Springs	98 miles
13	Below Hammond (to Lake Pontchartrain)	21 miles
14	Below Covington (To Lake Pontchartrain)	6 miles
15	Louisiana-Mississippi Stateline (to Lake Borgne)	13 miles

authority. Second, the state has limited permitting authority over an activity within *fastlands*. Fastlands are: *Lands surrounded by publicly owned, maintained, or otherwise validly existing levees, or natural formations, as of the effective date of this Part or as may be lawfully constructed in the future, which levees or natural formations would normally prevent activities, not to include the pumping of water for drainage purposes, within the surrounded area from having direct and significant impacts on coastal waters.* {La. R.S. 49:213.3(9)} The rationale for this permit boundary is that activities either above the five-foot contour or within fastlands normally would not have a direct or significant impact on the adjacent wetlands. The inland and permit boundary locations are important to the overall viability of the coastal wetlands because the lines define the extent of permitting authority of the primary state coastal agency. However, if a proposed activity exempted from permitting by the state program will result in discharges into coastal waters, or significantly change existing water flow into coastal waters, then the person proposing the activity shall notify the Secretary of the Department of Natural Resources (DNR) and provide information regarding the proposed activity as may be required by the Secretary of the DNR in deciding whether the activity is a use subject to a coastal permit. A coastal use permit will be required only for those elements of the activity which have direct and significant impacts on coastal waters.

Activities not requiring a coastal use permit include:

- a. Agricultural, forestry, and aquaculture activities on lands consistently used in the past for such activities.
- b. Hunting, fishing, trapping, and the preservation of scenic historic, and scientific areas and wildlife preserves.
- c. Normal maintenance or repair of existing structures including emergency repairs of damage caused by accident, fire, or the elements.
- d. Construction of a residence or camp.
- e. Construction and modification of navigational aids such as channel markers and anchor buoys.

- f. Activities which do not have a direct and significant impact on coastal waters.
- g. Uses and activities within the special area established the state act that have been permitted by the Offshore Terminal Authority in keeping with its environmental protection plan.
- h. Activities on lands five feet or more above sea level or within fastlands, unless they have a direct and significant impact on coastal waters.

A separate state office was established to administer the coastal program. Today the Coastal Management Division (CMD) resides in the Department of Natural Resources (DNR), and administers the coastal use permit process. Coastal use permit applications are reviewed by the CMD staff to determine if the project will have a direct and significant impact on the coastal zone. The CMD depends on existing Coastal Use Guidelines and rules for the review of permit applications. The Coastal Use Guidelines serve as the substantive standards and criteria for the CMD. Coastal Use Guidelines appear for: All uses; Levees; Linear Facilities; Dredged Spoil Deposition; Shoreline Modification; Surface Alterations; Hydrologic and Sediment Transport Modification; Disposal of Wastes; Uses that Result in the Alteration of Waters Draining into Coastal Waters; and Oil, Gas and other Mineral Activities (OCZM and CMS 1980).

For example, in the case of a development, the CMD determines if the project is of minimal size, if alternative locations have been considered, whether restoration is practical and mitigation necessary, or when the best practical techniques should be employed. CMD has enforcement and Federal consistency programs that complement the permitting. For those projects needing a federal permit, a water quality certificate (401 Certification) must be obtained from the Department of Environmental Quality before a permit will be issued.

In 1993, the Coastal Management Division reorganized into three program offices: Permits/mitigation; Interagency Affairs; and Support Services. The Permits/mitigation Program includes two sections, permits and mitigation. Permits regulate and control activities having direct and significant impacts on Louisiana coastal waters. The section reviews Coastal Use

Permit applications proposed by individuals and non-federal entities in the Louisiana coastal zone and makes recommendations to the Secretary of the Department of Natural Resources on coastal use permits. At the same time, the section makes recommendations on the consistency of those permit applications. The mitigation section is responsible for implementation of the mitigation regulations, which includes evaluation of proposed mitigation banks, establishing wetland values, and other duties related to the technical assessment of wetland mitigation.

Similar to the previous program, the Interagency Affairs Program is divided into two sections: Local Programs/Nonpoint Source Section and the Consistency Section. The Local Coastal Program group administers and monitors activities with respect to the implementation and progress of eight approved local coastal programs. Staff activities include grant administration with local programs; technical assistance and guidance for parishes attempting to establish a local program and for approved local programs; attending meetings with parish officials; acting as liaison between local coastal program administrators and the various state and federal agencies; and review of approved local programs. This section also works closely with the Department of Environmental Quality and other agencies and interests in the development of the state's coastal nonpoint pollution program. The Consistency Section reviews activities for consistency with the state's coastal program and closely coordinates with state and federal agencies during all phases of planning for major activities. The section works to have projects designed so that adverse impacts are minimized and beneficial use aspects are incorporated.

Finally, the Support Services Program is three sections: the Eastern Field Region Section; the Western Field Region Section; and the Education/Records Section. The two field sections perform on-site field investigations as needed or warranted. Inspections are performed for permit applications, enforcement, follow-up investigations (including mitigation and restoration), pre-application meetings, consistency matters, and other meetings as necessary with federal, state, and local officials. The section enforces the terms and conditions of Coastal Use Permits. The Education Section works with the public and the educational community to develop public interest and awareness in the Louisiana Coastal Resources Program. The staff makes daily

contact with the public who call, write, or drop by the office for information on Louisiana coastal zone and programs. Presentations are made at scheduled events, public gatherings, and interest groups. Coordination is maintained with the public information programs in the Coastal Restoration Section and the Governor's Office of Coastal Activities.

Act 361, Louisiana's Coastal Zone Management Act, provides for management programs at the state and local levels. Parishes with approved local programs (of which there are currently eight) have general jurisdiction over uses of local concern and comment authority over uses of state concern. Uses of local concern are permitted and regulated by the governing parish authority. Parishes may also comment to CMD on uses of state concern, and these comments must be given "considerable" weight in the decision-making process. Parish program administrators, in coordination with their coastal advisory committees, work closely with CMD local program, permit and field investigations staff to coordinate on-site field trips, attend preapplication and directional drilling meetings, ensure that local program comments are addressed, and oversee contract negotiations between the parish and CMD. Local programs staff routinely attend coastal advisory committee meetings to ensure proper coordination. Regional meetings are held quarterly in Baton Rouge to coordinate and evaluate all programs and to provide input into CMD's decision-making process. Thus, a high degree of coordination currently exists between CMD and approved parish programs.

The Louisiana Nonpoint Source Management Program

In response to Section 319 of the Clean Water Act (PL 100-4), the Louisiana Legislature designated the Department of Environmental Quality as the state's lead agency to develop and implement a Nonpoint Source (NPS) Management Program (La.R.S. 30:2011). The Office of Water Resources has prepared a Nonpoint Source Management Program (Office of Water Resources 1993) and a Nonpoint Source Assessment (Office of Water Resources 1993a) in accordance with EPA NPS guidance. The NPS Assessment Report (1993a):

1. identifies those navigable waters within Louisiana which, without additional action to control nonpoint source pollution cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of the Clean Water Act;
2. identifies those categories and subcategories of nonpoint sources which add significant pollution to each portion of the navigable waters identified under 1 above in amounts which contribute to such portion not meeting such water quality standards or such goals and requirements;
3. describes the process, including intergovernmental coordination and public participation, for identifying best management practices and measures to control each category and subcategory of nonpoint sources and, where appropriate, particular nonpoint sources identified under 2 above and to reduce to the maximum extent practicable, the level of pollution resulting from each category, subcategory, or source; and
4. identifies and describes the Louisiana and local programs for controlling pollution added from nonpoint sources to, and improving the quality of, each such portion of the navigable waters, including but not limited to those programs which are receiving Federal assistance.

The NPS Assessment Report describes eight categories of NPS pollutants: agriculture; silviculture; construction; urban runoff; resource extraction/exploration/development; saltwater intrusion; hydromodification; and septic tanks. Text and maps describe these categories and identify potential problem areas. For each category the suspected causes of pollution loading (sediment, pesticides, nutrients, organic matter, animal wastes, metals, organic and inorganic materials, pathogens, and oil and grease) are listed. The Nonpoint Source Pollution Management Program (Office of Water Resources 1993) sets Louisiana's method of addressing nonpoint source pollution reduction and is incorporated into this document by reference.

Louisiana has established procedures for its nonpoint pollution program (Office of Water Resources 1994). Within each water quality management basin and segment, seven landuse categories (urban; extractive; agricultural; forest land; water; wasteland; and barren land) are listed by acreage and percentage. Maps delineate dominant land use categories for each water quality management segment.

Within each of these river basins, waterbodies that do not fully support designated uses based on evaluated data are shown. Extractive data were generated through assessments made by field staff, who are asked to judge water quality conditions in waterbodies within their areas in terms of use support. Their judgment was based on their general knowledge gained from daily field activities, such as complaint investigations, fish kill investigations, facility inspections, short-term intensive surveys, and ambient data collection; their assessment was also based on their knowledge of point and nonpoint sources of pollution affecting a waterbody, landuse within the watershed, studies conducted by other agencies, and fishing success stories. The field staff rated each waterbody as fully, fully but threatened, partially, or not supporting designated uses. The determination of degree of (use) support was based upon U.S. Environmental Protection Agency guidelines and recommended criteria. The criteria were developed by the Association of State and Water Pollution Control Administrators in 1983; this was the precursor of the 1988 EPA guidance.

The degrees of support for multiple use waterbodies are defined as:

Fully supporting = All uses are fully supported;

Partially supporting = One or more uses are partially supported and remaining uses are fully supported;

Not supporting = One or more uses not supported.

The field staff also identified the known or suspected sources of pollution affecting waterbodies in question and the problem parameters or constituents. A severity of major, moderate, or minor was assigned to each waterbody rated as partial or not supporting uses. A severity rating of major was only assigned to waterbodies not supporting uses. The known or suspected sources and causes were coded according to the categories and subcategories of NPS pollution listed in the 305(b) (Office of Water Resources 1994) and the NPS guidance documents (Office of Water

Resources 1993). The assessment report also contains information on sources of ground water contamination and a summary that documents problems and solutions statewide.

The evaluative data are only utilized to target water bodies where nonpoint sources of pollution are suspected causes of water quality impairments. However, once that segment or watershed has been targeted, then the monitored data are utilized and analyzed to determine what implementation practices need to be initiated to correct the water quality problems. The DEQ surface monitoring program is designed to measure progress towards achieving water quality goals at the state and national level, to gather baseline data used in establishing and reviewing the state water quality standards, and to provide a data base for use in determining the assimilative capacity of the waters of the state. Information is also used to establish permit limits for wastewater discharges. The surface water monitoring program consists of **189 fixed station** long-term network (Figure B-2), intensive surveys, special studies, and wastewater discharge compliance sampling.

Samples collected monthly or bi-monthly are analyzed in the DEQ laboratory and use established EPA approved quality assurance parameters (Office of Water Resources 1994). The **monitored parameters** include:

pH; temperature; DO; salinity; alkalinity; hardness; turbidity; conductivity; sulfates; true color; chlorides; total Kjeldahl Nitrogen; total dissolved solids; total suspended solids; arsenic; cadmium; chromium; copper; mercury; lead; nickel; nitrate and nitrite nitrogen; total phosphorous; total organic carbon; and coliform bacteria.

Monitoring may take any of several forms (Office of Water Resources 1994). **Toxic substances monitoring** includes collection of environmental samples for analyses of pesticides and other anthropogenic organic compounds. Samples analyzed to date encompass various environmental matrices including ambient water, industrial and municipal effluents, fish, shellfish and sediments. **Fish tissue monitoring** activities are sampled in response to significant complaints, as a result of enforcement actions, or in response to other problems as

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Figure B-2

they occur. Monthly, the DEQ **Bioassay Laboratory** **analyzes** eight random water samples (one from each regional office) and two from the Mississippi River. Generally, a **chronic vertebrate test and a chronic invertebrate test** are initiated on freshwater samples. A **chronic vertebrate test and acute vertebrate test** are usually initiated on saline samples. The DEQ follows EPA protocols. Finally, **volunteer monitoring** samplers assist DEQ by doing visual observations, chemical and physical measurements, and biological assessments. A pilot project is underway on the Bogue Falaya River in the Pontchartrain Basin.

The Louisiana Nonpoint Source Pollution Management Program was prepared in accordance with guidance issued by EPA (Office of Water Resources 1993). Louisiana chose a cooperative, non-regulatory approach for implementation of the NPS Pollution Management Program in watersheds throughout the state. This cooperative approach is facilitated through an Interagency Committee (Table B-2) which consists of staff members from State and Federal agencies that have authorities to implement corrective measures necessary to reduce nonpoint source pollution. The purpose of the Interagency Committee is to determine the method and mode of program implementation, the sources of funding for implementing actions, and to evaluate whether steps taken did in fact improve water quality. The Interagency Committee also evaluates current management practices to determine if changes need to be made within their agencies' policies or activities to further reduce the input of nonpoint source pollutants. If further legislation is needed to implement these policies, or to initiate state funding for the NPS program, the Interagency Committee will determine the steps necessary to make these changes. Each agency participating in the Interagency Committee has agreed to cooperate with decisions made on implementing the NPS Program. Each agency has also signed a Memorandum of Understanding stating that the agency will continue to integrate water quality concerns into their ongoing programs and activities.

In summary then, the Interagency Committee functions as an advisory board which:

N recommends projects for implementation;

Table B-2. Members of the DEQ Nonpoint Source Interagency Committee.

LOUISIANA STATE AGENCIES

Department of Agriculture and Forestry
Department of Culture, Recreation, and Tourism
Department of Environmental Quality
Department of Health and Hospitals
Department of Natural Resources
Department of Transportation and Development
Department of Wildlife and Fisheries
Louisiana Cooperative Extension Service

FEDERAL AGENCIES

Agricultural Research Service
Agricultural Stabilization and Conservation (now the Consolidated Farm Services Agency)
U.S. Army Corps of Engineers
Farmers Home Administration (now part of the Rural Economic and Community Development Agency)
Soil Conservation Service (now the Natural Resources Conservation Service)
Fish and Wildlife Service, USDI
Forest Service, USDA
Geological Survey, USDI
Rural Development Administration (now part of the Rural Economic and Community Development Agency)

TRADE ORGANIZATIONS

Louisiana Farm Bureau
Louisiana Cattlemen's Association
Louisiana Forestry Association

FOUNDATIONS AND CITIZENS GROUPS

Lake Pontchartrain Basin Foundation

Citizens for a Clean Tangipahoa

Louisiana Nature Conservancy

City Park/University Lakes Commission, City of Baton Rouge

- N targets areas within the State for treatment;
- N recommends methods (BMPs), technology, and education programs;
- N implements the NPS Program in areas targeted for treatment;
- N tracks the effectiveness of implementation measures taken; and
- N continually determines the direction and effectiveness of the program.

The primary objective of the NPS Pollution Management Program is to implement BMPs that reduce the level of NPS pollution in the surface and ground waters of the state. In addition to BMP implementation, educational programs will be held at the local level in order to educate people about NPS pollution problems and the BMPs recommended by state and federal agencies to correct those problems. Demonstration projects are also an important component of the implementation process. These projects function as an educational tool to demonstrate the method and effectiveness of the BMPs in reducing NPS pollution. They also allow the state water quality agency to gather quantitative information on the effectiveness of the BMPs recommended for the reduction of NPS pollution (sediments, nutrients, pesticides, and metals). This evaluation of BMPs is reported back to the interagency committee through a feedback loop that allows continuous adjustment of the management practices recommended for NPS pollution abatement. Through this implementation process, corrective measures to reduce the level of sediments, metals, nutrients and pesticides entering surface and ground waters of the state can be initiated. For this program to be successful, it will take the continued cooperative efforts of government agencies that have authority over state and federal lands within Louisiana.

Currently, the NPS Management Program is implementing best management practices and demonstration projects in the Mermentau River Basin (05) on bank stabilization and rice farming (Bayou Queue de Tortue Sediment Reduction Project) and in the Tangipahoa River Basin (0407) related to dairy facilities and individual wastewater treatment systems. In urban areas, storm drain stenciling (for example, Jefferson and Orleans Parishes) and working with homeowners on yard maintenance (Lafayette parish) is being pursued. Other projects underway are implementation of sugarcane BMPs, working to reduce impacts of individual home sewage systems; and the use of no-phosphorus detergents. Brochures, posters, fact sheets, bumper stickers, and decals are printed and have been distributed (Nonpoint Source Program 1993). The DEQ is now working

on establishing cooperative agreements with the Office of Soil and Water Conservation, Louisiana Department of Agriculture and Forestry, for educational programs that encourage BMP implementation in the priority watersheds. With the Office of Forestry, Louisiana Department of Agriculture and Forestry, the DEQ is developing an interagency agreement to implement a statewide forestry educational program.

These programs are evaluated through an internal review process within DEQ, Office of Water Resources, and by participants of the Nonpoint Source Interagency Committee. Evaluation of programs are conducted on a project specific basis to determine if they are effective in improving water quality or need to be improved. Monitoring and tracking mechanisms, which include evaluative assessments by district and regional office personnel, allow these determinations to be made. The results of monitoring and tracking implementation methods are reported to the Interagency Committee to determine whether further steps need to be taken to improve water quality. This continued feedback mechanism allows for adjustments necessary to ensure the program's success in improving water quality. Yearly progress reports of Louisiana's Nonpoint Source Management Program are made to the U.S. Environmental Protection Agency and the U.S. Congress. The 1993 Nonpoint Source Annual Report is incorporated by reference (Nonpoint Source Program 1993).

The Barataria-Terrebonne National Estuary Program recently accepted a report (Laska et al. 1994) on the effectiveness of existing government programs in dealing with environmental problems. This report (incorporated by reference) presents each program and its objectives. For example, the objective of the Louisiana sewerage programs "is to safeguard the public's health by regulating the installation and operation of individual systems and by regulating sewerage treatment and disposal by municipal/community systems" (Laska et al. 1994, p. 78). The Louisiana Department of Health and Hospitals offers technical advice and service to parish and local governments from a high quality staff in each parish. Lack of funding and trained personnel combined with a low enforcement priority at the local government results in a program weakness.

With regard to the Nonpoint Source Program, the essential findings of the report (Laska et al. 1994) are:

The strength of the Nonpoint Source Program is the interagency cooperation method for addressing issues and problems (p. 64).

The Nonpoint Source Program weakness is insufficient staff (p. 64).

The Nonpoint Source Program is rated as highly effective through its cooperative approach (p. 176).

Coordination with other State and Federal programs

Neither the Coastal Management Division, Department of Natural Resources (DNR) nor the Department of Environmental Quality (DEQ) operates in isolation. No single state agency has ultimate responsibility for activities in the coastal zone or is responsible for all programs that contribute to reducing nonpoint source pollution. Act 361 provided for comprehensive management of coastal activities by incorporating existing state regulations into the coastal program. As a result, each agency, such as the Office of Conservation within DNR, the Department of Environmental Quality (DEQ), or the Department of Wildlife and Fisheries (DWF), continues to implement those of its regulations that do not directly reference the coastal use guidelines. Agencies are operating their own programs and are concentrating on different resources. Coordination takes place through the sharing of information and participation in a common permitting process (OCZM and CMS 1980). Memoranda of Understanding (MOUs) formalize this working relationship. Both DNR and DEQ coordinate activities with other state and federal agencies who have primary responsibility for controlling pollutants that may enter waterways or activities that could adversely impact water quality (Wilczynski and Wilkins 1994; U.S. Environmental Protection Agency 1991; Laska et al. 1994; Emmer and Calvert 1992). These documents are incorporated by reference and are, therefore, not repeated.

As part of the planning process for the Coastal Nonpoint Pollution Control Program, the Coastal Management Division has formed a statewide coordinating committee and subcommittees to address the five priority problems: agriculture; forestry; urban; hydromodification; and marinas. Each of the subcommittees is compiling detailed information on existing regulatory and nonregulatory programs that address nonpoint source pollution in that area of concern. An extensive report on their findings and recommendations will be submitted to the statewide committee for incorporation into the final report due in July 1995.

In addition, Act 361 provides for inclusion of existing state regulatory and nonregulatory programs into the Louisiana Coastal Resources Program in order to achieve the overall purposes of this Act (Office of Coastal Zone Management and Coastal Management Section 1980). The entire Louisiana Coastal Resources Program (LCRP) is incorporated by reference. The following summarizes agency responsibilities (Office of Coastal Zone Management and Coastal Management Section 1980) (See also Wilczynski and Wilkins 1994; U.S. Environmental Protection Agency 1991; Laska et al. 1994; Emmer and Calvert 1992):

Department of Natural Resources (DNR)

DNR has primary responsibility for the conservation, management, and development of water, minerals, and other natural resources of the state. Within DNR, but retaining independent authority over their functions, are the Commissioner of Conservation in the Office of Conservation and the State Mineral Board in the Office of Mineral Resources.

Department of Environmental Quality (DEQ)

DEQ has primary responsibility for the administration of air and water quality policies, solid and hazardous waste management and nuclear energy and radiation control.

Department of Transportation and Development (DOTD)

The Department of Transportation and Development's activities in the coastal zone include constructing of state highways, handling of public works projects, setting of

standards for water wells and commenting on pipeline crossings and construction of levees.

Department of Wildlife and Fisheries (DWF)

In addition to the roles and responsibilities provided by La.R.S. 49:213, the Department of Wildlife and Fisheries has primary responsibility for the control and supervision of the wildlife and fisheries of the state, including the management, protection, conservation and replenishment of wildlife, fish, and aquatic species; the management of wildlife management areas, refuges and preserves; aquatic weed control; scenic rivers; and the granting of oyster and shell leases.

Department of Health and Hospitals (DHH)

This department is primarily responsible for the development and provision of health and medical services for the prevention of disease and for certain aspects of regulation to the environment, including oyster and shellfish pollution control, sewage disposal, noise, and noxious odors.

Department of Culture, Recreation and Tourism (DCRT)

This department has primary responsibility for the development, maintenance, and operation of the state library, parks, recreational areas, museums, and other cultural facilities; the statewide development and implementation of cultural, recreational, tourism programs; and planning for future leisure needs. DCRT' coordinates protecting archaeological and historical sites in the coastal zone with LCRP.

Department of Public Safety (DPS)

DPS's responsibility for certain aspects of pipeline safety must be coordinated with the LCRP.

Coordination of these programs is through Memorandum of Understanding between the Coastal Management Division and the following:

Office of Conservation, Department of Natural Resources

Department of Environmental Quality
Department of Health and Human Resources
Department of Culture, Recreation and Tourism
Division of State Lands, Office of the Governor
Department of Agriculture
Department of Transportation and Development

Coordination of the Nonpoint Source Pollution Program is through Memorandum of Understanding between the Department of Environmental Quality and the following:

Department of Agriculture and Forestry
Department of Health and Human Resources
Department of Wildlife and Fisheries
Department of Environmental Quality
Department of Transportation and Development
Department of Culture, Recreation and Tourism
Department of Natural Resources
Department of Natural Resources, Office of Conservation
LSU Agriculture Center
Soil Conservation Service
Agricultural Stabilization and Conservation Service
USDA Agricultural Research Service
Farmers Home Administration
Rural Development Administration
Fish and Wildlife Service
Forest Service
U.S. Army, Corps of Engineers
U.S. Geological Survey

In addition to working with other agencies, the Department of Environmental Quality as the leader in Louisiana's water pollution control programs has several significant programs that are important. The Office of Water Resources has the responsibility of managing the quality of the state's surface waters by upgrading water quality where man's activities have caused degradation. The Continuing Planning Process (Office of Water Resources 1987) describes the DEQ's water pollution control program in detail and is incorporated by reference.

Water pollution control programs managed by the Office of Water Resources include municipal and industrial wastewater discharge permitting, compliance assurance inspections, enforcement of permit requirements and pollution control regulations, review and certification of projects affecting water quality, nonpoint pollution control programs, and enforcement actions. Programs of particular relevance are the wastewater discharge permit, compliance assurance inspections, and enforcement. The wastewater discharge permits are official authorization developed and promulgated by the Water Pollution Control Division, which establishes the wasteload content of wastewaters discharged into the waters of the state. The permitting process allows the state to control the amounts and types of wastewaters discharged into its surface waters. A permit is required for every point source discharge into the waters of the state of Louisiana.

Municipal and industrial point source discharges are monitored to verify compliance with permitted effluent limitations and compliance schedules. Major discharges are inspected annually (with sampling when necessary) to ensure compliance with applicable effluent limitations and state and federal permit requirements. Water quality certification is an activity undertaken by the Water Pollution Control Division to review proposed actions which could affect the quality of the state's water resources. Water quality certification is required by Section 401 of the Clean Water Act for all Section 402 (National Pollutant Discharge Elimination System) or Section 404 (dredge/fill) permits, and therefore applies to both point source and nonpoint source discharges. Included in the certification process for 404 activities are land clearing and drainage of agricultural lands, coastal

uses, certain highway and bridge construction, fill projects, oil and gas operations involving soil disturbances and hydrological alterations such as levee construction. The 401 certification for the Section 402 permit regulates all point source discharges and certifies that the federal limits set in the permit meet Louisiana's water quality standards and waste load allocation. The nonpoint source staff reviews revisions and conditions for new 404 permits. Some of the conditions in the certification include: keeping turbidity to a practicable minimum during dredging; using fill material that is free of contaminants; that side slopes of canals and levees be allowed to revegetate with natural plants; and that the hydrology of the area not be significantly altered.

Enforcement activities are designed to ensure that all water quality standards, rules, and regulations are handled in a rapid and consistent manner. The state's aggressive water quality enforcement program has resulted in an increased level of permit compliance achieved by discharges throughout the state.

A growing number of federal programs are being used by the Environmental Protection Agency when addressing nonpoint source pollution (Environmental Protection Agency 1992). The Department of Environmental Quality, because they believe it to be the most effective method for achieving nonpoint pollution reduction relies, on these programs and coordinates closely with them. For example, several Agricultural Stabilization and Conservation Service (Consolidated Farm Services Agency) programs contribute to reducing nonpoint source pollution, including:

- the Agricultural Conservation Program (goals: conserving soil and water; improving water quality);

- the Conservation Reserve Program (water quality improves because fewer pesticides, herbicides, and fertilizers are used);

- the Rural Clean Water Program (aids in development of best management practices);

- the Water Bank Program (designed to preserve, restore, and improve wetlands that results in conserving surface water and contributes to stream sedimentation); and

- the Forestry Incentives Program (enhancing clean water and improving water quality).

Education is of major importance to federal agencies. The U.S. Forest Service in cooperation with the National Association of State Foresters and other organizations publishes and distributes a brochure on nonpoint source pollution control (EPA 1992). The Forest Service and Extension Service incorporate nonpoint source control into its ongoing landowner training programs. These and many other programs are explained in more detail in the five committee reports (agriculture, forestry, urban, hydromodification, marinas) that are being developed.

Conclusions

The Department of Environmental Quality Nonpoint Source Pollution program is highly effective because of its cooperative approach to solving problems (Laska et al. 1994). In addition, numerous federal, state, and local agencies have regulatory and nonregulatory responsibilities for reducing nonpoint source pollution in the coastal zone as well as throughout the state. The state and federal agencies participating in the Nonpoint Source Program can effectively implement any changes that are necessary to reduce the level of pollutants generated from agriculture, forestry, mining, urban runoff, and other activities that produce sediments, nutrients, pesticides, and metals which are transported into surface and ground waters (Office of Water Resources 1993). State, federal, and local agencies can achieve the above because they oversee 386 programs that currently manage nonpoint related activities addressing water quality concerns. Through the Memoranda of Understanding and the Interagency Committee, the level of cooperation necessary for state and federal agencies to implement projects and programs to improve water quality exists (Office of Water Resources 1993).

IIC. A BOUNDARY FOR DELINEATING THE 6217 MANAGEMENT AREA

Louisiana's current coastal zone includes all or parts of 19 parishes (Figures II-1, II-2, and B-1) for a total of approximately 5.3 million acres. On the east and west the Louisiana coastal zone boundary is the state line with Mississippi and Texas, respectively. Offshore, the state's coastal zone extends to federal waters on the outer continental shelf as agreed to by the state and federal government. The inland boundary assumes many identities as it crosses the state. Eastward from the Texas state line the inland boundary corresponds to the north bank of the Gulf Intracoastal Waterway (GIWW) through Calcasieu and Vermilion parishes. In eastern Vermilion Parish the boundary begins to follow a number of highways, levees, parish lines, corporate limits, and physiographic features, as it meanders across south central Louisiana (OCZM and CMS 1980). In some stretches the boundary is described in relative positions, such as "one hundred yards inland from the mean high water line" of a specified watercourse, or "in the vicinity of" a habitable ridge. In southeastern Louisiana, the boundary follows Interstate Highway 12 from the vicinity of Baton Rouge to the Mississippi state line. In consideration of the complexity of the boundary and to clarify its location, the Louisiana Department of Transportation and Development prepared a legal description and large-scale maps showing a clearly marked inland boundary. The FEIS declares that the "inland boundary ... meets the minimum requirements of the CZMA in that it includes specific resource areas noted in Sections 301(1) and (2) of the CZMA and that the current inland boundary was chosen because it contains all the significant coastal resource areas and uses which directly and significantly affect coastal waters" (OCZM and CMS 1980).

Since 1978, the inland boundary has been amended three times. First, Act 361 allowed for minor adjustments around corporate limits of communities. In 1979, the Louisiana coastal zone was expanded to include all of St. James, St. John the Baptist, and St. Charles parishes and additional acreage in Livingston, Lafourche, St. Mary, and Assumption parishes. Finally, a portion of St. Martin Parish was included in the coastal zone in 1980.

IIC-2

In 1993, the NOAA proposed a different inland boundary for the Louisiana coastal zone called the coastal watershed boundary (Figure II-1). The coastal watershed is a hydrologically defined area considered for analysis purposes as an alternative to the existing coastal zone. The coastal watershed is defined by the inland extent of U.S. Geological Survey hydrologic cataloging units that contain the upstream extent of tidal influence. Watersheds draining entirely or partially to state coastal waters are:

Mississippi Sound (Lake Borgne)	G160a (shared with Mississippi)
Breton/Chandeleur Sounds	G170
Mississippi River	G180
Barataria Bay	G190
Terrebonne/Timbalier Bays	G200
Atchafalaya/Vermilion Bays	G210
Coastal Drainage Area	G218
Calcasieu Lake	G220
Sabine Lake	G230 (shared with Texas).

In choosing watersheds for inclusion in the program, the NOAA used several nonpoint source indicators:

- Land area ca. 1990;
- Population ca. 1990;
- Population change, 1990 - 2010;
- Combined sewer overflows ca. 1987;
- Total cropland ca. 1987;
- Harvested cropland ca. 1987;
- Soil loss from cropland ca. 1987;
- Agricultural fertilizer sold nitrogen ca. 1990;
- Agricultural fertilizer sold phosphorus ca. 1990;

Available nitrogen from animal waste ca. 1987;
Agricultural pesticide use - selected herbicides ca. 1982;
Agricultural pesticide use - selected insecticides ca. 1982.

The recommended federal watershed boundary varies significantly from the existing Louisiana inland coastal zone boundary (Figure II-1). Along the Texas border in the Sabine River basin, the NOAA boundary extends approximately 120 miles to the Toledo Bend dam on the Sabine River. Across the Prairie of southwest Louisiana, the boundary follows the USGS subsegments that border the Pleistocene-Recent contact. In south-central Louisiana, the coastal watershed boundary includes the Vermilion River and tributaries to Bayou Teche as well as the Atchafalaya River floodway. The Barataria and Terrebonne estuaries are within the boundary. To the east, the rivers that drain the Florida parishes are part of the system except for the Bogue Chitto River. The regulated area increases from approximately 5.3 million acres to an estimated 15 million acres and expands the state's jurisdiction to include previously exempted activities (agriculture, forestry, lands above 5 feet MSL, and fastlands).

The approach to addressing nonpoint pollution and, therefore, delineating the 6217 management area, rests on the meaning of the phrase "coastal waters" and on the definition of "significant" when dealing with impacts. First, the geographic region envisioned by CZARA must be as large as necessary to ensure that a nonpoint control program protects coastal waters. Coastal waters (Coastal Zone Management Act, Section 304(3B) as cited in NOAA 1993, p. BND-2) means:

... those waters, adjacent to the shorelines, which contain a measurable quantity or percentage of sea water, including, but not limited to, sounds, bays, lagoons, bayous, ponds, and estuaries.

The key to this definition appears to be the presence of "a measurable quantity or percentage of sea water". In Louisiana, coastal waters as described above are best demonstrated by mapping the distribution of fresh marshes (Figures II-1 and II-2), that is, that vegetative band containing plant species that do not tolerate sea water. The federal concept of coastal waters should not be confused

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with the definition of coastal waters as described in the Louisiana coastal zone program (La. R.S. 49:213.3(3)):

.. bays, lakes, inlets, estuaries, rivers, bayous, and other bodies of water within the boundaries of the coastal zone which have measurable seawater content (under normal weather conditions over a period of years).

The second criteria for delineating a 6217 management area hinges on the concept of "significant" when applied to the nonpoint program. For this, Louisiana relies on the Environmental Protection Agency (1993a, p. 5-65) who defines "significant" as "a quantity, amount, or degree of importance determined by a State or local government." The Louisiana Department of Environmental Quality is the primary state agency responsible for water quality issues and is designated as the agency for determining when an impact will be described as "significant" according to the EPA (1993a) definition.

For the purposes of the Louisiana nonpoint pollution program, the following discussion builds on the accumulated knowledge of published scientists and professionals employed by the Louisiana Department of Environmental Quality, the Department of Natural Resources, and other state agencies. Using the available information and expertise, coastal waters in Louisiana for the most part are adjacent to the Gulf of Mexico shoreline and do not include fresh marsh or swamps. The following sections discuss the 6217 management area based on readily available information and data.

Louisiana proposes an inland boundary for delineating the 6217 management area that more accurately depicts conditions in the field. The NOAA boundary was established using a set of selective indicators that theoretically contribute to nonpoint pollution of Louisiana's coastal waters. The central issue appears to be how closely the information on total cropland, harvested cropland, and the amount of agricultural fertilizers sold within a parish correlate with, or influence pollution of coastal waters or impacts to coastal waters. Although the type and extent of landuse activities can identify possible contributors to nonpoint source pollutant loading, it is erroneous to make absolute correlation between erosion rates or amount of fertilizer purchased and water quality impairments.

First, there is no guarantee that fertilizer purchased in a parish will be used in that parish or watershed.

Second, the Office of Technology Assessment (1987, p. 64) states:

However, the absolute quantity of pollutants is only a partial measure of their subsequent impact, for example, many riverborne pollutants are considerably more diluted or degraded by the time they reach marine waters than they would be if they had been released directly into those waters. Thus, the magnitude of marine impacts due to upstream sources is not necessarily commensurate with the magnitude of their pollutant impacts.

The proposition that pollutants entering a watershed may not reach coastal waters is not an isolated idea attributable only to the Office of Technology Assessment. Burroughs (1993, p. 132) makes the same contention:

Introduction of a contaminant to a watershed does not necessarily result in its release to coastal waters, because storage, losses to the atmosphere, or degradation may affect it.

Third, data indicate that the number of acres subject to application of commercial fertilizers decreased between 1982 and 1987 (Table C-1). Eadie et al. (1992, p. 7) believe that fertilizer consumption "although an imperfect surrogate for nutrient load, does appear to be correlated with the estimates of nitrogen flux from the Mississippi River." Therefore, if fertilizer consumption continues to decrease (1992 Census of Agriculture figures are not available), water pollution attributable to fertilizers should decrease.

The U.S. Department of Agriculture is working on sediment transport and delivery models that would be better indicators of what percentage of sediments and fertilizers actually enter a waterbody, compared to what is applied to the field or erodes from the field. If sediment leaves the field, but never enters the waterbody due to a levee or other hydrologic modifications, it would not be as high of a priority as an area where it actually enters the waterbody. Once it enters the waterbody, then instream monitoring determines if the problem poses a use impairment or violation of water quality standards, which are more appropriate measures of water pollution than specifically what happens

IIC-6

Table C-1

on the land. In other words, water quality information should be utilized as indicators of what needs to be done on the land, not selected landuse information as indicators of what needs to be done in the waterbody. A closer correlation between landuse and water quality impairment is needed than what is proposed by NOAA. Rather than create a whole new set of criteria and boundaries for the Section 6217 program, the Louisiana DNR and DEQ feel decisions should be based on more pertinent information.

The Louisiana Department of Environmental Quality (Office of Water Resources) presently utilizes water quality basins, segments, and subsegments to delineate the state's hydrologic units (Figure C-1 & C-1A). This classification system provides a finer resolution and scale for making determinations on which watersheds impact waters of the state from nonpoint sources of pollution. In the coastal region, these watershed or hydrologic unit boundaries are based on salinity, vegetation, and both natural and man-altered drainage patterns, which are more representative of where delineation lies between saline, brackish, and fresh waters than USGS hydrologic units. Many of these same parameters were utilized for delineating the state's existing coastal zone boundary, indicating that coastal waters would be protected if management measures were implemented within this boundary.

In FY 92-93 and FY 93-94 the CMD entered into a two phase contract with the Louisiana Department of Agriculture and Forestry to perform an assessment of management measures used in the coastal region for the control of nonpoint source pollution by the agriculture and forestry industries. The objectives of the study were threefold. First, the Department of Agriculture and Forestry (the Department) was to review and analyze all existing management measures currently being utilized by the agriculture and forestry industries in Louisiana. The geographic area of study consisted of the parishes in the approved coastal zone as well as that area within the first tier of parishes to the north of the Act 361 inland boundary. Only agricultural and forestland data from the parishes were utilized in data compilation even though the management basins extend beyond the study area. . Second, the Department was to identify and locate the relative proximity of agricultural and forest lands in the study area defined by the DEQ's Water Quality management basins. The third task was to assist in the production of MOAs with DNR, DEQ, and the Department through

IIC-8

Figure C-1

Figure C-1A

interagency coordination.

Based on the following discussion, Louisiana will utilize the Act 361 Coastal Zone boundary as best representing the 6217 management area. For analysis purposes, the inland boundary is discussed in ten intervals. These intervals are relatively uniform in their physical and biological characteristics and separate the Louisiana coastal boundary into distinct compartments. Beginning at the Texas-Louisiana border and progressing east to Mississippi, intervals are discussed as follows:

- N the geographic boundaries of the interval;
- N the criteria which apply to the interval;
- N the rationale; and
- N the types of supporting data.

Figure C-2 shows intervals along the state determined boundary for delineating the 6217 management area.

FIGURE C-2

INTERVAL 1. Texas-Louisiana border to Forked Island, LA

Geographic boundaries

Interval 1 follows the Gulf Intracoastal Waterway from the Texas stateline to Forked Island, Louisiana. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

Lands north of the GIWW only meet the criteria for coastal waters (a measurable quantity or percentage of sea water) along the Sabine River and the Calcasieu River in the vicinity of Lake Charles. The other lands north of the GIWW do not contain a measurable quantity or percentage of sea water. Marsh vegetation is the long-term indicator of sea water and the marshes in these areas, except as indicated, are characterized by freshwater species.

Second, the Louisiana Water Quality Management Plan, Water Quality Inventory for 1994 (Office of Water Resources 1994) shows that in the Sabine River basin, the problem is harvesting/restoration/residue management and surface mining in the Bayou Anacoco subsegment

(Figure C-1A, 110507; Table C-2). To the south, saltwater intrusion from the Gulf has changed marsh vegetation which is no longer fresh. In the Calcasieu River, the problem is urban runoff from Lake Charles and industrial discharges from point sources. Industries must comply with the NPDES program.

Third, the DEQ Section 319 program funds demonstration projects for reducing nonpoint pollutants from hydromodification and the rice industry in the Mermentau River Basin. The Queue de Tortue project has demonstrated that best management practices can reduce nonpoint source loads within bayous that drain through the river basin when implemented (Nonpoint Source Program 1993, pp. 134 - 135). Data from the first year of the demonstration project indicated that when the traditional practice of "mudding-in" was utilized, total solids concentration in the initial drainage waters from the rice fields were 8,450 mg/L. Two of the new rice management practices, conservation tillage and holding the water on the rice fields for 15-30 days before discharge, indicated that these concentrations could be reduced to 2,828 mg/L and 2,740 mg/L, respectively. In addition to the reduced sediment loads coming off of the rice fields, total organic carbon (TOC) loadings for two of the new rice management practices were 10.7 and 11.9 ppm with treatment compared to 155 ppm TOC without treatment.

As part of its education effort, the DEQ conducted an urban workshop in Lake Charles to advise Calcasieu Parish and Lake Charles planners about the nonpoint pollution problems and best management practices for addressing them. The DEQ has educational programs in the targeted watersheds (Office of Water Resources 1993).

Fourth, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Fifth, Gosselink et al. (1979) demonstrate that the Pecan Island Back Ridge, the embankment of

Table C2. Waterbodies and degree of support, southwestern Louisiana (Office of Water Resources 1994; See Figures C-1 and C-1A.).

Waterbody Segment Code	Degree of Support	Suspected Sources
110202	Full	
110801	Full	
110601	Full	
110507	Partial	Major industrial point sources Harvesting/restoration/ residue Management Surface mining
110301	Full	
031001	Full	
031002	Full	
030301	Full	
030304	Full	
030401	Full	
030304	Full	
031101	Full	
050601	Partial	Irrigated crop production
050402	Full	
050702	Full	
060801	Not	Industrial and municipal point sources Crop production Land development Urban runoff/storm sewers Petroleum activities Removal of riparian vegetation Spills

LA Highway 82, the Grand Chenier Ridge, the Front Ridge, and Oak Grove Ridge form a barrier to the southward movement of water. These impediments to flow create a freshwater basin, waters of which are used for irrigating rice fields.

Finally, the Louisiana Water Quality Management Plan, Water Quality Inventory for 1994 (Office of Water Resources 1994) shows the status of subsegments that are crossed by the proposed inland boundary and the possible sources of the problems. Point sources are subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the nonregulatory program (Nonpoint Source Program 1993). Sanitary facilities are subject to regulations and permitting through the Department of Health and Hospitals. The Department of Natural Resources controls activities through the coastal zone program. In addition, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant.

Types of supporting data

Office of Water Resources 1994 State of Louisiana Water Quality Management Plan. Section 305(b) Water Quality Inventory. Volume 5. Baton Rouge, LA: Department of Environmental Quality. 116 p. plus appendices.

Nonpoint Source Program 1993 1993 Nonpoint Source Annual Report. State of Louisiana. Baton Rouge, LA: Office of Water Resources, Department of Environmental Quality. 58 p.

Office of Water Resources 1993 State of Louisiana Water Quality Management Plan. Nonpoint Source Pollution Management Program. Volume 6, Part B. Baton Rouge, LA: Louisiana Department of Environmental Quality. 334 p.

Department of Environmental Quality 1994 Staff. Baton Rouge, LA.

INTERVAL 2. Forked Island to New Iberia (Figure C-3)

Geographic boundaries

Interval 2 follows Louisiana highways from Forked Island to New Iberia. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

Lands north of the Act 361 coastal zone boundary do not contain a measurable quantity or percentage of sea water. Marsh vegetation is the long-term indicator of sea water and the marshes in these areas, except as indicated, are characterized by freshwater species (Figure II-2). The Department of Environmental Quality (1994) has determined that land and water uses within a given area, either individually or cumulatively, do not have a significant impact on coastal waters.

Second, the Louisiana Water Quality Management Plan, Water Quality Inventory for 1994 (Office of Water Resources 1994) shows the status of subsegments that are crossed by the proposed inland boundary (Figure C-1A) and the possible sources of the problems. Point sources are

subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the nonregulatory program. Sanitary facilities are subject to regulations and permitting through the Department of Health and Hospitals. Finally, the Department of Natural Resources controls activities through the coastal zone program.

Third, the DEQ conducted an urban workshop in Lafayette on the causes of nonpoint pollution and the best management practices for addressing them.

Fourth, the DEQ is sponsoring a lawn care demonstration project in Lafayette and will use the information gained as part of the statewide education effort.

Finally, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Types of supporting data

Chabreck, R.H. and G. Linscombe 1988 Vegetative Type Map of the Louisiana Coastal Marshes. New Orleans: Louisiana Department of Wildlife and Fisheries. Oversize.

Office of Water Resources 1994 State of Louisiana Water Quality Management Plan. Section 305(b) Water Quality Inventory. Volume 5. Baton Rouge, LA: Department of Environmental Quality. 116 p. plus appendices.

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Office of Water Resources 1993 State of Louisiana Water Quality Management Plan. Nonpoint Source Pollution Management Program. Volume 6, Part B. Baton Rouge, LA: Louisiana Department of Environmental Quality. 334 p.

Nonpoint Source Program 1993 1993 Nonpoint Source Annual Report. State of Louisiana. Baton Rouge, LA: Office of Water Resources, Department of Environmental Quality. October. 58 p.

Department of Environmental Quality 1994 Staff. Baton Rouge, LA.

**INTERVAL 3. New Iberia to Lower Atchafalaya River at Berwick
(Figure C-3)**

Geographic boundaries

Interval 3 follows highways from New Iberia to Berwick. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

Lands north of the Act 361 coastal zone boundary do not contain a measurable quantity or percentage of sea water. Marsh vegetation is the long-term indicator of sea water and the marshes in these areas (Figure II-2), except as indicated, are characterized by freshwater species. The DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant.

Second, the Soil Conservation Service (1966) shows water movement is from the crest of the Bayou Teche natural levee eastward into the low-lying basin. The natural levees of Bayou Teche

and the embankment for LA Highway 182 serve as an impediment to water movement into the coast. For example, in the vicinity of New Iberia, the LA Highway 182 right-of-way is between 60 feet and 80 feet wide and the average surface elevation is between 23 feet and 25 feet. The drainage pattern is from north to south. Water moves south through cypress swamps and Lakes Fausse Pointe and Dauterive and the Charenton Canal before entering coastal waters of West Cote Blanche Bay.

Third, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Finally, the Louisiana Water Quality Management Plan (Office of Water Resources 1994) shows the status of subsegments that are crossed by the proposed inland boundary (Figure C-1A) and the possible sources of the problems. Point sources are subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the nonregulatory program. Sanitary facilities are subject to regulations and permitting through the Department of Health and Hospitals. Finally, the DNR controls activities through the coastal zone program.

Types of supporting data

Soil Conservation Service 1966 Upper Bayou Teche Watershed Work Plan. Iberia, St. Martin, and St. Landry Parishes, Louisiana. Alexandria, LA. August. 39 p.

Chabreck, R.H. and G. Linscombe 1988 Vegetative Type Map of the Louisiana Coastal Marshes. New Orleans: Louisiana Department of Wildlife and Fisheries. Oversize.

Office of Water Resources 1994 State of Louisiana Water Quality Management Plan. Section 305(b) Water Quality Inventory. Volume 5. Baton Rouge, LA: Department of Environmental Quality. 116 p. plus appendices.

Office of Water Resources 1993 State of Louisiana Water Quality Management Plan. Nonpoint Source Pollution Management Program. Volume 6, Part B. Baton Rouge, LA: Louisiana Department of Environmental Quality. 334 p.

Nonpoint Source Program 1993 1993 Nonpoint Source Annual Report. State of Louisiana. Baton Rouge, LA: Office of Water Resources, DEQ. 58 p.

Department of Environmental Quality 1994 Staff. Baton Rouge, LA.

INTERVAL 4. The Atchafalaya River and Floodway (Figure C-3)

Geographic boundaries

Interval 4 follows the coastal zone line between Berwick and Morgan City, LA. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary. The area of interest, however, is the Atchafalaya Floodway from the Old River Control Structure on the Mississippi River to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.

Rationale

The Louisiana Water Quality Management Plan, Water Quality Inventory for 1994 (Office of Water Resources 1994) shows the areas within the Atchafalaya Floodway are not adversely impacted by nonpoint source pollution.

Second, the Atchafalaya River is the principal tributary of the Mississippi River (Nickles and Pokrefke 1984; Atwood 1992). The natural basin of the Atchafalaya River extends from the Teche ridge on the west to the Mississippi River natural levees and the Lafourche ridge on the east. The Atchafalaya Floodway is the central portion of the Atchafalaya Basin that is within the U.S. Army Corps of Engineers flood control guidelevees that are roughly 15 miles apart. The

Atchafalaya Floodway is an essential element of the Flood Control, Mississippi River and Tributaries program authorized by Congress in 1928. The Old River Control structure was authorized in 1956 and reinforced by the Old River Control Auxiliary Structure in the 1980s. The Atchafalaya Floodway, one of the largest remaining alluvial floodplain hardwood swamps in the United States, covering more than 700,000 acres, has an authorized capacity of 1,500,000 cubic feet per second flood capacity.

"The volume of water that is allowed through the control structure determines the character of the entire Atchafalaya Basin Floodway Complex" (van Beek et al. 1979, p. 13).

"The process most important to the ecology of the Atchafalaya Basin is the annual flooding and dewatering of the Atchafalaya River flood plain within the floodway guide levees" (van Beek et al. 1979, p. 14).

Pollutants (nutrients and conventional pollutants) in the Atchafalaya and Mississippi Rivers probably originate primarily upstream from point source discharges and nonpoint runoff (OTA 1987a). Rabalais (1992) believes that differences between nutrient concentrations in the Atchafalaya River and the Mississippi River are a consequence of the differences in the water quality of the Red River which mixes with Mississippi River water to form the Atchafalaya.

The NOAA Coastal Ocean Program determined that flow from the Mississippi and Atchafalaya Rivers (accounting for two-thirds and one-third of the drainage from the Mississippi River basin) drives extremely high production of algae along the Louisiana Shelf (Atwood 1992).

Stage data seldom show the Atchafalaya receiving less than 30% of the flood of the Mississippi River, no matter the month or the year. In other words, the Atchafalaya owes its character and size to the Mississippi and, to a lesser degree, the Red Rivers. To put it another way, the Atchafalaya River reflects the Mississippi River (but at a half scale) and the Red River. The

Atchafalaya River should be exempted from this program as the Mississippi River and Red Rivers are exempt.

Third, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Types of supporting data

Office of Water Resources 1994 State of Louisiana Water Quality Management Plan. Section 305(b) Water Quality Inventory. Volume 5. Baton Rouge, LA: Department of Environmental Quality. 116 p. plus appendices.

Chabreck, R.H. and G. Linscombe 1988 Vegetative Type Map of the Louisiana Coastal Marshes. New Orleans: Louisiana Department of Wildlife and Fisheries. Oversize.

van Beek, J.L., A. L. Harmon, C.L. Wax, and K.M. Wicker 1979 Operation of the Old River Control Project, Atchafalaya Basin: An Evaluation from a Multiuse Management Standpoint. EPA-600/4-79-073. Las Vegas: Environmental Protection Agency. 72 p.

Atwood, D. 1992 Nutrient Enhanced Coastal Ocean Productivity (NECOP) -- Mississippi-Atchafalaya River Outflow. In: J.D. Jacobson (ed.) America's Sea - Keep it Shining. The Gulf of Mexico Symposium. Issues and Opportunities. December 10-12, 1992, Tarpon Springs, FL. Stennis, MS: Gulf of Mexico Program Office. pp. 22-23.

Office of Technology Assessment 1987 Wastes in Marine Environments. OTA-0-334. Washington, D.C.: U.S. Congress. 313 p.

Office of Technology Assessment 1987a Wastes in Marine Environments. Summary.
Washington, D.C.: U.S. Congress.

Rabalais, N.N. 1992 An Updated Summary of Status and Trends in Indicators of Nutrient
Enrichment in the Gulf of Mexico. Report to Gulf of Mexico Program, Nutrient Enrichment
Subcommittee. EPA/800-R-92-004. U.S. Environmental Protection Agency, Office of Water,
Gulf of Mexico Program, Stennis Space Center, Mississippi. 421 p.

Department of Environmental Quality 1994 Staff. Baton Rouge, LA.

INTERVAL 5. Morgan City to Houma, LA (Figure C-3)

Geographic boundaries

Interval 5 follows the east guidelevee of the Atchafalaya Floodway north to the Iberia Parish line and then south along the Assumption Parish line to Lake Palourde and Morgan City. The line tracks east following the Gulf Intracoastal Waterway to the western edge of Houma. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

Lands north of the Act 361 coastal zone boundary do not contain a measurable quantity or percentage of sea water. Marsh vegetation is the long-term indicator of sea water and the marshes in these areas (Figure II-2), except as indicated, are characterized by freshwater species. In addition, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part are point sources of pollution, or the issues are covered by other regulatory programs.

Second, the Soil Conservation Service (1969) shows water movement is from the crest of the natural levees into the low-lying basin. The drainage pattern is from north to south. Water moves south through cypress swamps and Lakes Verret, Grassy Lake, and Lake Palourde before entering coastal waters south of the Gulf Intracoastal Waterway. Water quality problems in the Morgan City area and the Bayous Chene, Boeuf, and Black region are related to point source runoff from industry and Morgan City.

Third, several barriers impede flow from the northern end of the watershed. These barriers include the U.S. Highway 190 embankment between Baton Rouge and the east guidelevee of the Atchafalaya basin; the Interstate Highway embankment from Baton Rouge to the east guidelevee of the Atchafalaya basin; the Gulf Intracoastal Waterway and dredge disposal sites between Baton Rouge and the Bayou Sorrell locks in the east guidelevee of the Atchafalaya basin; and state highway embankments, including LA Highway 75 from Plaquemines to the east guidelevee and LA Highway 70 between Paincourtville and Belle River (road elevations range eight feet MSL to five feet MSL and rights-of-way from 40 ft to 100 ft).

Third, coastal waters are separated from inland runoff by four physical barriers: the railroad embankment from Morgan City to Gibson, LA; the on-grade roadbed of U.S. Highway 90 from Morgan City to Gibson; the natural levee ridge of Bayou Black from Gibson to Houma; and the Gulf Intracoastal Waterway from Morgan City to Houma. For example, from Houma to Morgan City, the natural levees of Bayou Black separate the inland wetlands from the coast. U.S. Highway 90 follows the crest of the west natural levee (elevation 8 - 10 feet MSL and a right-of-way of 32 to 50 ft) to the vicinity of Gibson and then crosses the cypress swamp on embankment to Amelia, paralleling a railroad embankment. Natural levees continue to the Lower Atchafalaya River.

Fourth, suspected sources for pollution for subsegment 120403 include (Figure C-1): major industrial point sources; minor industrial sources; minor municipal point sources; package plants; domestic wastewater lagoons; pasturelands; aquaculture; other urban runoff; petroleum activities;

industrial land treatments; septic tanks; hazardous wastes; flow regulations/modifications; and spills. It appears the causes of the problems are mostly point sources.

Finally, the Louisiana Water Quality Management Plan, Water Quality Inventory for 1994 (Office of Water Resources 1994) shows the status of subsegments that are crossed by the proposed inland boundary and the possible sources of the problems. Point sources are subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the nonregulatory program. Sanitary facilities are subject to regulations and permitting through the Department of Health and Hospitals. And, the Department of Natural Resources controls activities through the coastal zone program.

Types of supporting data

Chabreck, R.H. and G. Linscombe 1988 Vegetative Type Map of the Louisiana Coastal Marshes. New Orleans: Louisiana Department of Wildlife and Fisheries. Oversize.

Office of Water Resources 1994 State of Louisiana Water Quality Management Plan. Section 305(b) Water Quality Inventory. Volume 5. Baton Rouge, LA: Department of Environmental Quality. 116 p. plus appendices.

Office of Water Resources 1993 State of Louisiana Water Quality Management Plan. Nonpoint Source Pollution Management Program. Volume 6, Part B. Baton Rouge, LA: Louisiana Department of Environmental Quality. 334 p.

Soil Conservation Service 1969 Lake Verret Watershed Work Plan. Ascension, Assumption, and Iberville Parishes, Louisiana. Alexandria, LA. 44 p.

U.S. Geological Survey 1983 Morgan City, Louisiana. 1:100,000-scale metric topographic-bathymetric map. 30 X 60 minute Quadrangle. National Ocean Survey. 29091-E1-TB-100.

U.S. Geological Survey 1983 New Orleans, Louisiana. 1:100,000-scale metric topographic-bathymetric map. 30 X 60 minute Quadrangle. National Ocean Survey. 29090-E1-TB-100.

Louisiana Department of Highways 1974 Environmental Evaluation, Morgan City-Gibson Highway. Baton Rouge, LA 3 vols.

Nonpoint Source Program 1993 1993 Nonpoint Source Annual Report. State of Louisiana. Baton Rouge, LA: Office of Water Resources, DEQ 58 p.

Department of Environmental Quality 1994 Staff. Baton Rouge, LA.

INTERVAL 6. South of Houma, LA (Figure C-3)

Geographic boundaries

Interval 6 follows a line in the wetlands. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

Lands north of the Act 361 coastal zone boundary do not contain a measurable quantity or percentage of sea water. Marsh vegetation is the long-term indicator of sea water and the marshes in these areas (Figure II-2), except as indicated, are characterized by freshwater species. In addition, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Second, the Louisiana Water Quality Management Plan, Water Quality Inventory for 1994 (Office of Water Resources 1994) shows the status of subsegments that are crossed by the proposed inland boundary and the possible sources of the problems. Point sources are subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the

nonregulatory program. Sanitary facilities are subject to regulations and permitting through the Department of Health and Hospitals. Finally, the Department of Natural Resources controls activities through the coastal zone program.

Types of supporting data

Office of Water Resources 1994 State of Louisiana Water Quality Management Plan. Section 305(b) Water Quality Inventory. Volume 5. Baton Rouge, LA: Department of Environmental Quality. 116 p. plus appendices.

Chabreck, R.H. and G. Linscombe 1988 Vegetative Type Map of the Louisiana Coastal Marshes. New Orleans: Louisiana Department of Wildlife and Fisheries. Oversize.

Nonpoint Source Program 1993 1993 Nonpoint Source Annual Report. State of Louisiana. Baton Rouge, LA: Office of Water Resources, Department of Environmental Quality. 58 p.

Office of Water Resources 1993 State of Louisiana Water Quality Management Plan. Nonpoint Source Pollution Management Program. Volume 6, Part B. Baton Rouge, LA: Louisiana Department of Environmental Quality. 334 p.

Department of Environmental Quality 1994 Staff. Baton Rouge, LA.

INTERVAL 7. Houma to Bayou Lafourche at Larose, LA (Figure C-3)

Geographic boundaries

Interval 7 follows Louisiana Highway 24. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

Water movement is from the crest of the natural levees into the low-lying basin. The drainage pattern is from north to south. Water moves south through cypress swamps and lakes before entering coastal waters south of the Gulf Intracoastal Waterway. Water quality problems in the Thibodaux and Houma area are related to point source runoff from industry, package plants, domestic wastewater lagoons, urban runoff, septic tanks, flow regulations/modifications, and highway maintenance and runoff. Sanitary facilities are regulated by the Department of Health and Hospitals. The Department of Transportation and Development has regulations for controlling pollutants from its projects.

Second, Bayou Lafourche does not meet its degree of support. Pumps at Donaldsonville maintain the flow in Bayou Lafourche, which is the potable water supply for all the communities from Donaldsonville to the Gulf Intracoastal Waterway, is the source of industrial needs, and is used for irrigation. The Mississippi River is the dominant factor in determining the quality of water that flows in Bayou Lafourche. Until the sources of nonpoint pollution to the Mississippi River are addressed, Bayou Lafourche will remain in its present condition.

Third, inland areas are compartmentalized. Subbasins are physically separated from coastal waters by the on-grade roadway of U.S. Highway 90 between Houma and Raceland (average elevations of between eight and nine feet and a right-of-way width of 200 ft); by the Company Canal and spoil bank from Houma to Lockport on Bayou Lafourche; by the Gulf Intracoastal Waterway between Houma and Larose; and by the natural ridge of the Bayou Blue system that also serves as the foundation for Louisiana Highway 24.

Fourth, the DEQ conducted an urban workshop in Thibodaux for planners from Lafourche Parish, Thibodaux, and Houma/Terrebonne to explain the causes of nonpoint pollution and the best management practices that address the problems.

Fifth, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Finally, the Louisiana Water Quality Management Plan (Office of Water Resources 1994) shows the status of subsegments that are crossed by the proposed inland boundary and the possible sources of the problems. Point sources are subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the nonregulatory program. And, the Department of Natural Resources controls activities through the coastal zone program.

Types of supporting data

Office of Water Resources 1994 State of Louisiana Water Quality Management Plan. Section 305(b) Water Quality Inventory. Volume 5. Baton Rouge, LA: Department of Environmental Quality. 116 p. plus appendices.

Office of Water Resources 1993 State of Louisiana Water Quality Management Plan. Nonpoint Source Pollution Management Program. Volume 6, Part B. Baton Rouge, LA: Louisiana Department of Environmental Quality. 334 p.

Nonpoint Source Program 1993 1993 Nonpoint Source Annual Report. State of Louisiana. Baton Rouge, LA: Office of Water Resources, Department of Environmental Quality. 58 p.

Department of Environmental Quality 1994 Staff. Baton Rouge, LA.

**INTERVAL 8. Bayou Lafourche (Larose) to the west bank of the Mississippi River
(Figure C-3)**

Geographic boundaries

Interval 8 follows the Gulf Intracoastal Waterway to Lake Salvador and then parish boundaries to the west bank of the Mississippi River. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

Lands inland of the Act 361 coastal zone boundary do not contain a measurable quantity or percentage of sea water. Marsh vegetation is the long-term indicator of sea water and the marshes in these areas (Figure II-2), except as indicated, are characterized by freshwater species. In addition, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Second, water movements flow from the crest of the natural levees into the low-lying Barataria basin. The drainage pattern is from north to south. Water moves through Lac des Allemands, Lake Beouf, and Lake Salvador before entering coastal waters south of the Gulf Intracoastal Waterway.

Third, the inland wetlands are compartmentalized (Hartman et al. 1988). The extreme upper basin, between the natural levees of Bayou Lafourche and the Mississippi River, is separated from the lower basins by natural ridges between Thibodaux and Kraemer and Louisiana Highways 20 and 307 on-grade roadway south of Lower Vacherie. Runoff from the fields on Bayou Lafourche natural levees between Thibodaux and Raceland flows north to an enclosed basin surrounded by Louisiana Highways 20 and 307. The primary conveyance is Bayou Boeuf into Lac des Allemands. The primary exit from the upper Barataria Basin into southern wetlands is Bayou des Allemands at Des Allemands. This is the only significant physical break in the Southern Pacific Railroad embankment and U.S. Highway 90 on-grade roadway between Raceland on the Bayou Lafourche natural levee and the Mississippi River natural levee at Boutte, St. Charles Parish, LA.

Finally, the Louisiana Water Quality Management Plan (Office of Water Resources 1994) shows the status of subsegments that are crossed by the proposed inland boundary and the possible sources of the problems. Point sources are subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the nonregulatory program. A demonstration project for sugarcane is being done in cooperation with the Barataria-Terrebonne National Estuary. The results of the project will be shared with other farmers through the DEQ education programs. Sanitary facilities are subject to regulations and permitting through the Department of Health and Hospitals. Finally, the Department of Natural Resources controls activities through the coastal zone program.

Types of supporting data

Office of Water Resources 1994 State of Louisiana Water Quality Management Plan. Section 305(b) Water Quality Inventory. Volume 5. Baton Rouge, LA: Department of Environmental Quality. 116 p. plus appendices.

Office of Water Resources 1993 State of Louisiana Water Quality Management Plan. Nonpoint Source Pollution Management Program. Volume 6, Part B. Baton Rouge, LA: Louisiana Department of Environmental Quality. 334 p.

Hartman, R.D., D.R. Cahoon, and S.G. Leibowitz 1988 Development of Management Strategies for Barataria Basin. Final Report. DNR Interagency Agreement 21911-88-11. Baton Rouge, LA.

Nonpoint Source Program 1993 1993 Nonpoint Source Annual Report. State of Louisiana. Baton Rouge, LA: Office of Water Resources, Department of Environmental Quality. 58 p.

Department of Environmental Quality 1994 Staff. Baton Rouge, LA.

THE MISSISSIPPI RIVER

Geographic boundaries

The Mississippi River basin from Latitude 31° North to the Gulf of Mexico.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

The Mississippi River drainage includes approximately 41% of the continental United States. To place this in perspective, the drainage area of the Mississippi River above St. Francisville, LA (River Mile 266 Above Head of Passes) is 1,125,300 square miles (720,192,000 acres) (Dantin et al. 1993). Average annual discharge of the Mississippi River is 564,000 cfs, while flood discharge is 2,200,000 cfs (Kolb and Dornbusch 1975). The annual sediment discharge is reported as 517,000,000 tons (Kolb and Dornbusch 1975), although this has been decreasing to approximately 200,000,000 tons because of the up stream flood control projects (Meade and Parker 1985; Hartmann and Goldstein 1994). A deficit in sediment load is immediately apparent. Sediment sources include farmlands and urban development in the mid-continent, forest lands, erosion of banks and point bars as the channel meanders within the confining flood control levees,

and maintenance of navigation channels (Kesel 1988, 1989; Meade and Parker 1985). Louisiana straddles the end of the funnel through which mid-America passes its wastes. Sediment that reaches the mouth of the Mississippi River is deposited in the deep water of the offshore Gulf of Mexico and does not significantly contribute to wetlands creation (Hartmann and Goldstein 1994; Boesch et al. 1994).

The main channel of the Mississippi River in Louisiana owes much of its water quality characteristics to industrial and sewage point sources and nonpoint sources (agriculture, forestry, and urban areas) in the neighboring states of Arkansas and Mississippi and the mid-continent of the United States (Rabalais 1992; Robinson and Marks 1994). For example, the upper Mississippi and Ohio River watersheds are major sources of phosphorous and nitrogen that reach the Gulf of Mexico (Robinson and Marks 1994). The United States Geological Survey studies show that millions of tons of herbicides annually reach the Mississippi River from Midwest agriculture. Samples contain atrazine, cyanazine, and metolachlor (Robinson and Marks 1994). Animal wastes contribute to agricultural runoff as a major impairment of streams in Arkansas, Iowa, Mississippi, Missouri, and Wisconsin. Nutrient runoff from farm fields, lawns, golf courses, and animals is a major cause of elevated nutrients in the Mississippi River. Nutrient over enrichment links the upper and lower Mississippi river systems (Robinson and Marks 1994).

This should not imply that Louisiana contributes nothing to the river problems. Industrial facilities and sewage treatment plants in the Baton Rouge to New Orleans corridor discharge through point sources that are regulated by the NPDES program. However, runoff from agricultural fields, forests, and population centers drains into the intertributary basins and does not get into the river (Anonymous 1989; van Beek et al. 1982). Natural levees along the Mississippi River are highest near the channel, slope into the backswamp, and decrease in elevation the closer they get to the Gulf of Mexico (Kolb and van Lopik 1958; Kolb 1962). For example, near Old River, the northern extent of the area of interest, the natural levees are between 35 and 38 feet Mean Sea Level (MSL). Heights and widths decrease downstream until at Donaldsonville, where Bayou Lafourche bifurcates from the Mississippi, the natural levees are

approximately 20 feet MSL and three miles across. At New Orleans, the natural levees are 2.5 miles wide and 12 - 15 feet high. By the time the natural levees reach the mouth of the river, they blend into the marsh and eventually disappear as easily recognized physiographic features.

Discharging precipitation into the Mississippi River requires pumping water against gravity, a practice that is neither realistic nor economical as demonstrated by over 200 years of drainage engineering in New Orleans (Janssen 1987; Snowden, Ward, and Studlick 1980; Wagner and Durabb 1976). In fact, only one pump station in Baton Rouge, the Capitol Lake facility, is known to practice this method. This anomaly occurs because the watershed is on the Pleistocene terrace above the Mississippi River floodplain and the natural flow into the river is blocked by the Mississippi mainline flood control levees protecting residential and industrial sections of Baton Rouge. To address pollution problems, Baton Rouge submitted its nonpoint pollution abatement plan with EPA Region 6.

Finally, reconfiguration of the hydrology of the Mississippi valley through federal projects virtually eliminates runoff from Louisiana finding its way into the Mississippi River. The Louisiana Department of Environmental Quality (DEQ) reports (1994, p. B-36) that the Mississippi River between the Arkansas stateline and the Old River Control Structure "does not get any tributary flow from the Louisiana side, which is leveed." Between the Old River Control Structure and Baton Rouge, the Mississippi River "does receive tributary flow from Thompson's Creek, Bayou Sara, Tunica Bayou, and Monte Sano Bayou. The river is leveed on both the east and west banks from Baton Rouge below Monte Sano Bayou to Venice." (DEQ, 1994, p. B-36). The DEQ observation is reinforced by the U.S. Army Corps (1981) in its mammoth New Orleans - Baton Rouge Metropolitan Area Water Resources Study. The study area was southeast Louisiana and included the upper part of the Terrebonne basin, the Barataria basin, the Lake Pontchartrain basin, and the main stem of the Mississippi River. The Corps states (1981, p. 24):

The flow of the Mississippi River originates almost entirely outside the study area, with the exception of tributary flow from Thompson Creek, Bayou Sara, and tributaries in West Feliciana Parish, and Monte Sano and Bayou Baton

Rouge in East Baton Rouge Parish. The levee system along the Mississippi River serves as a funnel by which the runoff from about one-third of the United States passes through the study area.

To put the size of these tributaries into perspective, the average discharge of the Mississippi River is 564,000 cfs, while the average discharge of Bayou Sara is 126 cfs and Thompson's Creek is 385 cfs (Stanley Consultants, Inc. 1980).

Because of the flood control levees, the Mississippi River does not affect surface water quality in the adjacent estuaries (USACE 1985) except in the vicinity of the Corps of Engineers' Bonnet Carre Floodway, at the Corps of Engineers' Caernarvon Freshwater Diversion, in the vicinity of several state and federal freshwater siphons in Plaquemines Parish, and at the mouth of the river south of Venice. Flood control levees are authorized by the Flood Control, Mississippi River and Tributaries project adopted by the Flood Control Act of May 15, 1928, as amended. These levees are shown in Mississippi River Commission (1971) and Emmer et al. (1983). Continuous levees for approximately 200 miles (from Monte Sano Bayou in Baton Rouge to Phoenix, LA on the east bank) and for 295 miles (from the Old River Control Structure to Venice, LA on the west bank) prevent overbank flooding and crevasses, depriving the estuaries of freshwater and sediment, the basic building blocks of the coastal wetlands (Gagliano and van Beek 1970; Kesel 1988,1989; Boesch et al. 1994).

Nonpoint source runoff that enters the Mississippi River in Louisiana originates from the mid-continent of the United States, precipitation falling within the mainline flood protection levees, and from the small tributaries in the Feliciana parishes, approximately 265 miles north of the Gulf of Mexico. Without any doubt the nonpoint pollution problem in the Mississippi River results from activities in other states, from Mississippi to Minnesota and from Pennsylvania to Montana, with parts of Canada on the fringe. In Louisiana, the lands between the Corps' flood control levees and the Mississippi channel are known as battures. Battures are a portion of the river bed which is exposed during low water and are inundated at times of ordinary high water (Anonymous 1990; Gove 1981; Louisiana Revised Statutes 1994; Padgett 1940). Because they are subject to

annual flooding of the river and are really part of the floodwater conveyance system their intensive use is risky and row crop agriculture is not known to exist on the batture. This Water Quality Management Segment (0703) is 94,694 acres and extends from Monte Sano Bayou in Baton Rouge to Head of Passes, a distance of approximately 240 river miles. This equates to 395 ac/mile of river (94,694 ac/240 mi), of which 60% (236 ac/mile) is water. The distribution of land uses is: Urban - 14.3%; Extractive - 0.9%; Agricultural - 9.9%; Forest - 7.9%; Water - 59.8; Wetland - 5.9%; and Barren Land - 1.2% (DEQ 1994a). The Department of Agriculture and Forestry (1994) shows no sugarcane, soybeans, wheat and feed grains, pasture, or forestry in the Mississippi River Basin for Iberville, Ascension, St. James, St. John, St. Charles, Jefferson, Orleans, St. Bernard, or Plaquemines parishes. East Baton Rouge shows some pasture acreage and forestry, most of which is on the Pleistocene uplands east of the river valley. The Urban component is composed of those segments of commerce engaged in international trade (dry docks, wharves, terminals, etc.) and industrial facilities on the river side of the flood control levees. There are no known cities, towns, villages, or similar communities within the flood control levees. To the north, Old River Lake is an oxbow of the Mississippi; Devil's Swamp Lake is in the batture; and Bayou Baton Rouge drains a small Pleistocene watershed. None of these areas is protected by Corps of Engineers' mainline levees. This Water Quality Management Segment (0702) is 179,575 acres. The distribution of land uses is: Urban - 1.1%; Extractive - 0.2%; Agricultural - 12.3%; Forest - 28.6%; Water - 23.8; Wetland - 33.3%; and Barren Land - 0.6% (DEQ 1994a).

Agricultural activities do occur in the Thompson's Creek/Bayou Sara watersheds (West Feliciana Parish and the western quarter of East Feliciana Parish) and in the vicinity of Old River. In West Feliciana Parish (273,280 acres) (Secretary of State 1989) are 130 cattle operations with an estimated 9,500 head and 300 milk cows (Louisiana Cooperative Extension Service 1993), which in simplest terms equals 0.04 head/acre. Cotton (670 acres or 0.002% of the parish), corn (1,356 acres or 0.005% of the parish), grain sorghum (230 acres or 0.0008% of the parish), soybeans (4,066 acres or 0.02% of the parish), wheat (201 acres or 0.0007% of the parish), and sweet potatoes (200 acres or 0.0007% of the parish) complete the commercial agricultural production in

the parish. Home gardens account for another 700 acres or 0.003% of the parish. Over 200,000 acres are in 200 hunting leases, land that are overwhelmingly wooded with limited livestock. East Feliciana Parish (291,200 acres) is divided between the Amite River watershed to the east (three quarters of the parish) and Thompson's Creek, the western quarter of the parish. Most of the cattle and dairies are in the Amite Basin which channels water past Baton Rouge to Lake Maurepas. The East Feliciana side of the Thompson's Creek watershed has some cattle, crops, and hunting leases, but similar to West Feliciana Parish the operations are scattered across a broad area. Additional acreage is within the Conservation Reserve Program. In West Feliciana Parish this amounts to 5,176 acres and in East Feliciana another 7,033 acres.

Willows are the dominant woody vegetation on the batture. In the river parishes (Ascension to St. Charles Parishes) young men with chainsaws annually cut a supply for the bonfires to guide Papa Noel on Christmas eve. Commercial forest activities are concentrated on the Pleistocene terraces and blufflands of the Felicianas. Forest activities are not recorded for this stretch of river (Department of Agriculture and Forestry 1994) and are not cited as a source of nonpoint pollution in the Mississippi River basin (Department of Environmental Quality 1994).

Several practices modify the hydrology of the Mississippi system. No doubt the greatest human contributor of sediment to the water column is the Corps of Engineers. The New Orleans District maintains a 45 ft navigation channel from the Gulf of Mexico to Baton Rouge and assists in dredging shoals in harbors, a project that moves millions of cubic yards of sand, silt, and clay each year. For example, in 1989 maintenance dredging from Baton Rouge to New Orleans removed approximately 6,000,000 cubic yards of material from the navigation channel. In the New Orleans harbor, 2,700,000 cubic yards of material were dredged (U.S. Army Corps of Engineers 1989). Removal is a simple operation; sediment is excavated from the shoals and placed in the main current of the channel for dispersal or is transported to deeper holes for release. A more accurate description of the process would be relocation of materials within the same channel using natural processes to distribute the sands and silts. Even though this may appear as a large volume, the river is still operating at a sediment deficit due to flood control projects on the tributaries.

Another form of hydromodification is mineral extraction canals found at the mouth of the river at the termini of the flood control levees. Third, the batture serves as a renewable source of fill material (sand) for construction sites. Numerous sand pits are found on the batture, such as south of Baton Rouge and in Harahan, Jefferson Parish, LA. Annual spring floods replenish the sands for another year of commercial extraction, a traditional source of building materials (Padgett 1940). Fourth, the Corps lines the river banks with revetments to help stabilize the channel. Unfortunately, this commonly accelerates erosion in meanders downstream from the work, thus necessitating further engineering projects. Fifth, except along the east bank of the Mississippi from Capitol Lake to the Mississippi stateline, urban runoff does not enter the Mississippi River. Baton Rouge submitted its nonpoint pollution plan to EPA Region 6, addressing the greatest problem. The area to the north is rural with St. Francisville (population approximately 2000) as the largest town. Sixth, most of the sediment in the Mississippi River south of Old River travels to the mouth of the river where it is deposited offshore onto the continental front and continental shelf and becomes a lost resource. Finally, only shipping facilities (wharves and associated parking areas) are in the batture with most located in the New Orleans metropolitan and Baton Rouge areas.

By far the dominant source of nonpoint pollutants in the Mississippi River has been demonstrated to be the mid-continent of the United States. What may reach the river from the Feliciana parishes during flood has no demonstrable effect on the character of the Mississippi River because of its volume and its mixing. Land uses within the batture are limited to grazing cattle, sand excavation, and docks for commercial shipping. To effectively address nonpoint pollution problems in the Mississippi River as it passes through Louisiana the federal government must regulate land uses and implement best management practices on the farms, in the forests, and across the urban areas in the Mississippi River watershed beyond the borders of the state. Implementation of BMPs within the batture is not practical, feasible, or realistic. Finally, the Coastal Management Division, Louisiana Department of Natural Resources through the coastal program could not address the sources of pollution in other states.

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**INTERVAL 9. Mississippi River (east bank) to I-12 at Denham Springs, LA
(Figure C-3)**

Geographic boundaries

Interval 9 follows parish boundaries to Denham Springs, LA. This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

Lands inland of the Act 361 coastal zone boundary do not contain a measurable quantity or percentage of sea water. Marsh vegetation is the long-term indicator of sea water and the marshes in these areas (Figure II-2), except as indicated, are characterized by freshwater species. In addition, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Second, water movement is from the crest of the natural levees and Pleistocene terraces into the low-lying basins such as Bayou Fountain, East Baton Rouge Parish, and the area around Gonzales, LA. It is common knowledge that the quality of water passing through wetlands may be enhanced in Louisiana as elsewhere (Burke et al. 1988; Chabreck 1988; Frome and Shenkman 1990; Hammer 1988; Hartman et al. 1988; Kusler 1983; Mitch and Gosselink 1986; Nixon and Lee 1986; Rabalais 1980; Sather et al. 1984; Stone et al. 1978).

Third, Baton Rouge must comply with NPDES requirements for municipalities over 100,000 and its nonpoint pollution abatement plan is under review by EPA, Region 6.

Fourth, the DEQ conducted an urban workshop in Baton Rouge to explain the causes of nonpoint pollution and discuss the best management practices for addressing them.

Finally, the Louisiana Water Quality Management Plan (Office of Water Resources 1994) shows the status of subsegments that are crossed by the proposed inland boundary and the possible sources of the problems. Point sources are subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the nonregulatory program. Sanitary facilities are subject to regulations and permitting through the Department of Health and Hospitals. The Department of Natural Resources controls activities through the coastal zone program.

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INTERVAL 10. Denham Springs to East Pearl River
(Mississippi state line) (Figure C-3)

Geographic boundaries

Interval 10 follows Interstate Highway 12 from Denham Springs to the East Pearl River (Mississippi state line). This corresponds to the present Act 361 coastal zone boundary. The Section 6217 management area boundary corresponds to the Act 361 boundary.

Criteria which apply to the interval

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

Rationale

The Louisiana Water Quality Management Plan (Office of Water Resources 1994) shows the status of subsegments (Figure C-1) that are crossed by the proposed inland boundary and the possible sources of the problems (Table C-3). Point sources are subject to permits from the Department of Environmental Quality. Agricultural and forestry interests are cooperating with the Department of Environmental Quality, Nonpoint Source Unit through the nonregulatory program. Sanitary facilities are subject to regulations and permitting through the Department of Health and Hospitals. Finally, the Department of Natural Resources controls activities through the coastal zone program.

Table C-3. Waterbodies and degree of support along the north shore of Lake Pontchartrain
(Office of Water Resources 1994).

Waterbody Segment Code	Degree of Support	Suspected Sources
040305	Partial	Minor industrial point sources Minor municipal point sources Package plants Sewer/stormwater overflow Land development Urban runoff/storm sewers Wastewater Landfills Septic tanks Dredging
040403	Full	
040404	Partial	Major industrial point sources Minor industrial point sources Minor municipal point sources Package plants Sewer/stormwater overflow Highway/road/bridge construction Land development Urban runoff/storm sewers Wastewater Septic tanks Channelization Dredging Bridge construction Highway maintenance and runoff Groundwater loadings
040502	Full	
040503	Full	
040504	Full	
040505	Full	

Table C-3 (cont'd)

Waterbody Segment Code	Degree of Support	Suspected Sources
040702	Partial	Package plants Sewer/stormwater overflow Forest management Land development Urban runoff/storm sewers Septic tanks Recreational activities Upstream sources
040802	Not	Municipal point sources Inflow and infiltration Urban runoff/storm sewers Septic tanks Upstream sources
040804	Partial	Inflow and infiltration Pastureland Septic tanks
040901	Full	
040904	Partial	Septic tanks Upstream sources
040907	Not	Sewer/stormwater overflow Urban runoff/storm sewers Septic tanks Contaminated sediments Inactive/abandoned hazardous waste
040908	Not	Minor industrial point sources Inflow and infiltration Septic tanks
040909	Not	Inflow and infiltration Urban runoff/storm sewers Septic tanks
090202	Full	
090207	Full	

Second, the upper part of the Tangipahoa River basin (Segment 040701), i.e., north of Interstate Highway 12, has had a problem with pollution from dairy farms and inadequately treated sewage. The Louisiana Department of Environmental Quality, through its Section 319 program, has designated the Tangipahoa River basin a demonstration project and, in cooperation with the Natural Resource Conservation Service, the Consolidated Farm Services Agency, the Louisiana Cooperative Extension Service, the Louisiana Farm Bureau, and the dairy industry initiated projects to reduce runoff from dairy farms. Approximately 200 of the 273 dairymen agreed to participate in the dairy lagoon program. An estimated 130 animal waste systems have been installed (Nonpoint Source Program 1993). This cooperative project has been very successful in getting farmers to participate and has won the Nonpoint Section of DEQ an EPA Region 6 award.

Cities and individual homeowners along the Tangipahoa River are upgrading their sewage treatment, which has also helped reduce pollution.

A citizens action group, Citizen's for a Clean Tangipahoa, is organized and very active in educating the public about the problems within the watershed and what steps individuals can take to assist in improving water quality (Nonpoint Source Program 1993).

As a result of all these efforts, water quality in the Tangipahoa watershed has improved. Mean fecal coliform levels (all stations combined) declined from 7933 cells per 100 mL sample in 1988 to 1979 cells per 100 mL sample in 1993 (Nonpoint Source Program 1993). Voluntary, cooperative programs can be effective when properly implemented and monitored.

Third, the DEQ conducted an urban workshop on nonpoint source pollution in Mandeville to advise St. Tammany Parish and Mandeville planners about best management practices.

Fourth, the DEQ (1994) has determined that the contributions of nonpoint pollution to coastal waters are not significant because the subsegments are meeting their designated uses, or the origin

of problems are for the most part point sources of pollution, or the issues are covered by other regulatory programs.

Types of supporting data

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IID. SUMMARY

This report analyzed the causes and significance of nonpoint source pollution to Louisiana coastal waters (Coastal Zone Management Act, Section 304(3B)) in order to be able to determine an inland boundary for addressing the causes of the problems. The final decision of the location of the 6217 boundary resides with the state. Louisiana will use the existing Act 361 coastal zone inland boundary as accurately defining the 6217 management area. Activities north of the existing Act 361 coastal zone are addressed through other state and federal authorities as well as the voluntary program already implemented by the Louisiana Department of Environmental Quality.

This decision was based on an analysis of published and unpublished information and data. This report used the criteria recommended by NOAA for proposing alternative boundaries:

1. Information indicating whether land and water uses within a given area, either individually or cumulatively, have significant impacts on the state's coastal waters.
2. Information indicating that certain areas are hydrologically isolated from the coastal waters of the state.
3. Information describing the physical characteristics of an area, such as slope and soil composition, and analysis of how these characteristics affect nonpoint source (NPS) pollution creation and delivery to coastal waters.
4. Information related to transport characteristics such as distance from coastal waters, stream order, time of travel, and fates and effects.
5. Combinations of environmental data to produce a rating scheme or pollution potential analysis.
6. Information detailing existing land uses and management regimes, and the effectiveness of the management regime in controlling NPS pollution.

The Environmental Protection Agency reports that evaluations of ongoing or completed watershed projects provide new information about successes (EPA 1993, p. 44):

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- N** Without vigorous, targeted, and effective education and information programs, technical assistance and cost-share programs cannot secure adequate BMP implementation.
- N** Regulatory programs can be effective. They often provide more equitable solutions and achieve results faster than the more random voluntary programs; however, poorly enforced regulatory programs or programs that do not contain an effective education and information program are little more effective than voluntary cost-share programs.
- N** The most successful projects use a mix of voluntary and regulatory incentives to achieve water quality results. The most effective incentive packages offer variable cost-share rates, market-based incentives, and regulatory back-up coupled with corporate and governmental support services to keep the BMPs maintained and operating properly.

The above points accurately describe the existing Louisiana Nonpoint Source Pollution program which is rated as highly effective (Laska et al. 1994).

The Office of Technology Assessment (1987; 1987a) believes that there is need for greater coordination and cooperation among responsible agencies to identify site-specific problems and allocate revenues toward the most effective control efforts. In Louisiana, two systems now network existing federal and state agencies and independent expertise into problem identification and management decisions. The DEQ Nonpoint Source Program through its Interagency Committee builds on extensive expertise for decisions and evaluations. Decisions are implemented through Memoranda of Understanding with participating agencies. The Coastal Management Division similarly has Memoranda of Understanding for cooperation in enforcing the coastal use guidelines.

Applying criteria 1, 2, and 6, Louisiana has demonstrated that the Act 361 coastal zone boundary and the Section 6217 boundary are identical. Coastal wetlands, except along the Sabine River, are within the Act 361 coastal zone. According to the Louisiana Department of Environmental Quality the land and water uses inland from the Act 361 coastal zone boundary do not, either individually or cumulatively, have a significant impact on the coastal waters. In addition, the

physical characteristics of most areas is such that the coastal zone is compartmentalized and certain areas are hydrologically isolated from the coastal waters by natural levees, highways, or railroad embankments. In the case of the Atchafalaya Floodway, it derives its characteristics from the Mississippi River which drains approximately 41% of the United States. Existing management regimes address sources of pollution through many programs, including education, technical assistance, information cost-sharing, and peer pressure.

In Louisiana, the real issue that should be addressed is the need to upgrade enforcement of existing programs such as septic tank inspections. Existing programs are applicable throughout Louisiana and not restricted to the coastal zone.

In summary, an investigation of the physical-biological setting, water quality data, and regulatory programs in combination with non-regulatory programs leads the Department of Natural Resources and Department of Environmental Quality to conclude that the Act 361 coastal zone boundary and the 6217 inland boundary are the same.

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CHAPTER III

COORDINATION REQUIREMENTS

for the

LOUISIANA

COASTAL NONPOINT POLLUTION CONTROL PROGRAM

Coastal Management Division

Louisiana Department of Natural Resources

prepared in cooperation and coordination with

Office of Water Resources

Louisiana Department of Environmental Quality

July 1995

CHAPTER III

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A. TECHNICAL ASSISTANCE

During the development of Louisiana's Coastal Nonpoint Pollution Control Program, the Coastal Management Division (CMD) staff of the Louisiana Dept. of Natural Resources (LDNR) has begun laying groundwork to provide technical assistance to local government entities and the general public. CMD staff give CNPCP updates at local government meetings, seminars, workshops, advisory committee gatherings and conferences. The CMD staff also routinely attend and participate in meetings, workshops, seminars and conferences held for the public, including industry and user groups. In addition, articles and updates on the CNPCP are prepared and published in various newsletters, press releases, organizational bulletins and user group correspondence. Regional meetings were held early on in the development process to explain the program to the public and encourage active participation throughout the development and implementation phases. A chronology follows, delineating the technical assistance provided thus far, along with training and other preparation for the higher level of technical assistance required for the implementation phase.

EFFORTS TO DATE

In August, 1993 the CMD executed a contract with LSU Sea Grant Legal to review existing laws and authorities to determine if they provided a basis for an enforceable policy component of the CNPCP. The contractor contacted all affected parishes to solicit local ordinances/regulations/laws pertaining to nonpoint pollution. August also saw CMD execute contracts with LDEQ and LDAF to coordinate all aspects of the development of the CNPCP and to assist CMD in formulating public education/outreach programs.

In September of 1993, the CMD staff made a presentation on management measures to a workshop held at LSU involving federal, state and local program staff, as well as industry and

user group personnel. Staff also attended LDEQ's nonpoint source interagency committee meeting and gave attendees an update on the development of the program. In October of 1993 a local program managers meeting was held wherein CMD staff presented a slide show on the CNPCP and its development stages, including the roles that local programs will play in the process and the technical assistance needed during development and implementation. An article for inclusion in the *Louisiana Coast Lines* newsletter updating the development of the CNPCP was also prepared. This newsletter has a mailing list of over 1500 members, including government agency personnel, industry, user groups, environmental organizations and concerned citizens.

During November CMD staff attended EPA's workshop on "Management and Protection of Coastal Waters: Tools for Local Governments". The information received from this workshop was then forwarded to local governments via memorandum for their review and comment. Our staff also met with LSU Cooperative Extension Service staff to discuss the public education/outreach contract and the deliverables to be obtained. In December CMD staff attended and made a presentation on the progress of the program's development at DEQ's statewide nonpoint source interagency committee meeting. Staff also attended the technical assistance workshop in Silver Springs, Md. and transmitted the information obtained at the meeting to the local governments. Another CNPCP update article was also written for inclusion in the CZM newsletter. Finally, in December the CMD staff transmitted copies of EPA's Coastal Nonpoint Source Pollution bulletin to all marinas in the coastal zone and requested comments and/or recommendations from the marina industry.

In January of 1994 CMD staff participated in the Louisiana Coalition for Wastewater Treatment meeting. We discussed model sewage ordinances, enforcement mechanisms, public education and outreach programs, training programs for sewage treatment installers, and development of a grass roots organization for support of and adoption of a uniform parish ordinance. During the month we also sent out information packets to our newly formed Coastal Nonpoint Pollution Control Committee, composed of fifty-seven (57) federal, state, and local agency personnel,

environmental groups, industry, user groups and university personnel concerned with nonpoint source pollution.

February 1994 saw the CMD staff preparing a news release for the *Louisiana Coast Lines* newsletter updating the development of the CNPCP. We also conducted the first CNPCP Interagency Committee meeting. Agenda items included a general overview and history of the CNPCP, review of the tasks required in the state's work plan, the objectives of the committee, and the formation of five (5) subcommittees - one for each of the sources to be addressed in the program. Staff also attended and participated in a forestry BMP demonstration project workshop, and the information obtained was brought back and discussed at the next forestry subcommittee meeting. Nonpoint staff also attended the Gulf of Mexico public education and outreach meeting, and their outreach strategies were discussed in subcommittee meetings. Finally, we also met during the month with LDEQ staff to discuss the coordination received to date and further technical assistance needed.

LDNR/CMD Nonpoint staff attended LDEQ's interagency committee meeting in March, 1994 and gave a report on the development status of the CNPCP. Staff also attended a Marina Environmental Workshop during that month. Agenda items included discussions on marina environmental management, nonpoint pollution guidelines, EPA and Clean Vessel Act boat sewage controls, NPDES storm water permits vs. CZARA program, and a review of state-by-state mini-workshops. This information was then brought back and discussed at the next marina subcommittee meeting. In March, CMD staff attended a LDWF boat pumpout meeting for marinas and provided input on the requirements of the CNPCP for new pumpout stations. Meetings of all five nonpoint subcommittees were held, coordinated by CNPCP staff.

In April of 1994 CNPCP staff attended the EPA sponsored "Water Quality Standards Workshop" in Albuquerque, New Mexico. Information obtained at this meeting was discussed at the monthly subcommittee meetings. Staff also attended a marina owners and operators meeting in Mandeville, La., and presented information on the CNPCP management measures for marinas,

agency responsibilities, and recommended BMP's currently in use in Louisiana. April also saw all five subcommittees meet and discuss pertinent program development items.

Another article for the *Louisiana Coast Lines* newsletter giving an update on the development of the CNPCP was prepared and published in early May of 1994. Four public education/outreach meetings were held during the month in Lafayette, Thibodaux, Lake Charles and Kenner including presentations by CNPCP staff on the five sources of nonpoint pollution to be addressed in the program, agency presentations on their responsibilities under the CNPCP, and a question and answer session. Staff attended LDEQ's nonpoint source interagency committee and presented an update on the development of the CNPCP. Also in May all subcommittees met at least once to develop the sections of the program as required by NOAA and EPA.

LDNR/CMD staff in June of 1994 attended LDEQ's urban subcommittee meeting and gave an update on the status of the development of the CNPCP to the group. Another article updating the development of the CNPCP was prepared and published in the *Louisiana Coast Lines* newsletter. Louisiana sent NOAA and EPA copies of the boundary recommendation and forestry section of the program document in preparation for July's informational meeting at NOAA headquarters. During this month the Coastal Interagency Committee convened for the second time. Agenda items included an overview of progress of program development, the status of ongoing contracts, discussion of threshold review requirements and the upcoming "informational" meeting, status reports on all five subcommittees, and a question and answer period. Subcommittees continued to meet during the month to continue developing the program document.

Early July found the CNPCP staff preparing for the "informational" meeting to be held in Silver Springs, Maryland. Guidance received at the meeting was discussed at later subcommittee meetings. LDEQ and LDNR staff coordinated a dairy animal waste management tour to gather information on wastewater lagoons for possible inclusion in our agriculture section. In August CMD staff met with an interagency group to discuss pollution prevention assessments. A

presentation was made on agriculture BMP's at the American Society of Farm Managers and Rural Appraisers annual meeting during August. An interagency wetlands silviculture tour was also held in August to review in the field forestry BMP's utilized in wetland forests. August 22-25 CNPCP staff attended the EPA and USDA Forest Service sponsored conference entitled "Evaluating the Effectiveness of Forestry BMP's in Meeting Water Quality Goals" held in Blacksburg, Virginia. The agenda included presentations on forestry interactions with water quality, watershed demonstration projects, literature databases, classification systems, monitoring and case histories on BMP effectiveness. Information obtained at the conference was presented and discussed at the next forestry subcommittee meeting.

On September 7-9, 1994 CNPCP staff attended the EPA workshop entitled "The Sixth Annual Tri Region Nonpoint Source Program Conference" in White Haven, Pennsylvania. Agenda items included sessions on watershed approaches, elements of a successful watershed project, targeting and establishing achievable watershed restoration and protection goals, funding sources for watershed protection, federal agency roles in watershed protection, examples of enforceable policy, and animal operations. Staff also attended the Coastal Nonpoint Program Coordinators Workshop in Port Deposit, Maryland in September. Information from both these meetings was brought back, disseminated and discussed at all subcommittee meetings. A presentation on the progress of the CNPCP document was also made during this month at LDEQ's urban subcommittee meeting.

Staff from the CMD attended LDEQ's nonpoint source interagency committee in October and gave a status report on the development of the CNPCP. Also in October staff sent out proposed marina BMP's to all marina subcommittee members for review and comment. An aquaculture BMP study committee meeting was also attended by CMD staff. This meeting centered on relevant practices utilized by aquaculture producers, and a rough ranking of the practices. All coastal nonpoint subcommittees met during this month to continue developing the program document.

In November of 1994, staff attended and made a presentation on the CNPCP at the first annual meeting of the Marina and Boatyard Association of Louisiana. Agenda items included the major environmental issues affecting marinas and boatyards, environmental educational initiatives, and regulations affecting the boating industry. Most of the nonpoint subcommittees also met during the month to continue developing the CNPCP.

December, 1994, found CNPCP staff attending the Lake Pontchartrain Basin Foundation workshop entitled "Innovative Wastewater Treatments for the Lake Pontchartrain Basin". Presentations were made at this meeting on treated wastewater discharges into natural wetlands using natural wetlands for wastewater treatment, municipal experiences with natural wetlands by city engineers, wastewater treatment needs, and the results from the operation of pilot and full-size facilities using innovative wastewater treatments. LDNR staff also met in December with LDEQ officials (319 Program) to discuss and request data to justify the 6217 boundary counter-proposed by Louisiana. Staff also made a presentation in December at the Louisiana Farm Bureau Federation conference entitled "Coastal Wetlands." Besides the CNPCP presentation other topics discussed included coastal restoration program activities, agricultural impacts from CZARA, the long-term coastal restoration plan for Louisiana, wetlands functions and values, and wetland determinations and delineations on agricultural lands. All subcommittees met this month to continue with their assigned tasks.

In January, 1995, the threshold review document was completed and forwarded to NOAA and EPA. Also in January, an update on the contents of the threshold review document was transmitted to all Coastal Nonpoint Interagency Committee members. Staff attended and participated in a nonpoint source pollution workshop held in Alexandria, La. January 11-12. Agenda items included updates by the NRCS, SSWCC, NACD and CNPCP programs as well as committee meetings on resource conservation, information/education, marsh, forestry, legislative and water resources. The CNPCP staff also manned our portable display booth during the conference and handed out pamphlets and posters discussing the CNPCP. An update on the development of the CNPCP was also prepared for LDEQ's January NPS newsletter. On January

26 several CNPCP staff members also participated in LDWF's marina pumpout meeting. The grant monies obtained by LDWF from the Clean Vessel Program will pay for construction and renovation costs of sewage waste disposal facilities at marinas and will promote their use through information and education. Finally in late January and early February CNPCP staff attended the 1995 Gulf/Caribbean Regional Workshop in Orange Beach, Alabama. The information gleaned at this workshop was transmitted to all interagency committee and subcommittee members via memorandum. All subcommittees met in January to carry on with respective tasks.

The CNPCP Coastal Nonpoint Interagency Committee met in February of 1995 and members were given an update on the development of the program document by each subcommittee as well as the agenda for the upcoming threshold review. Staff also attended and made a presentation at the EPA sponsored "Management and Protection of Estuaries and Coastal Waters: Tools for Local Governments" workshop held in New Orleans in February. Agenda items included the following: dynamics of coastal watersheds; models for watershed management; carrying capacity of watersheds; regulatory tools for watershed management; non-regulatory tools for watershed management; techniques to institutionalize watershed management plans; financing a watershed management program; local examples of watershed management; county/state programs useful to local officials; a review of the state's CNPCP; and a group exercise in coastal resource management. Staff members also attended a marina waste management workshop in Covington, La. designed for marina/boatyard managers, state and federal environmental agency personnel, waste management and recycling operators and the general public who want to learn more about waste management and recycling practices for marinas. Another article updating the development of the CNPCP was prepared and published in February's *Louisiana Coast Lines* newsletter. Finally, in February Louisiana held its threshold review meeting on the boundary and all five source categories. All subcommittees met this month to prepare documentation for the threshold review meeting.

CMD staff attended a clean vessel workshop sponsored by LDWF in March of 1995 designed to assist marina and boatyard operators/owners with preparing grant requests for pumpout stations.

We received comments on CNPCP draft legislation from NOAA's legal counsel this month and began revisions. A staff member also attended a conference sponsored by the USDA entitled "Clean Water-Clean Environment-21st Century" designed to discuss the implications of agricultural and water quality issues, identifying emerging issues, and to develop strategies to protect or enhance water quality in economically, socially and environmentally rational ways. An article for the *Nonpoint News*, DEQ's bimonthly bulletin, was prepared in March to update members on the status of the CNPCP. Finally in late March CNPCP staff attended the Coastal Zone Management Program Managers Meeting held in Washington, and actively participated in the nonpoint sessions held during the course of the three-day meeting. Since the beginning of April CNPCP staff and our committee and subcommittees have been refining the program document and awaiting comments on a previously submitted document.

LOOKING AHEAD

Technical Assistance initiatives can be expected to command much greater emphasis during the monitoring and implementation phases of the CNPCP. Contracts emphasizing **demonstration** projects as part of the CNPCP have been arranged for fiscal year 1995/1996. Discussions have taken place to examine how to give *coastal* projects still higher priority in LDEQ's statewide nonpoint source management program. In fact the LDEQ has many projects in progress that offer promise of helping implement the CNPCP. These include demonstration projects already alluded to, and the development of technical guidance materials such as **model ordinances** for storm water management designed for local government agencies. Many initiatives categorized as "public outreach" overlap with the technical assistance category. LDNR will make efforts to coordinate with LDEQ and other agencies to promote complementary efforts. Agencies whose traditional mission emphasizes technical assistance will be drawn upon to make use of their expertise and resources, as appropriate. Such agencies include the Louisiana Cooperative Extension Service, the Louisiana Sea Grant College Program, and the Natural Resources Conservation Service, while numerous other entities are expected to play a role, including the

Louisiana Dept. of Agriculture and Forestry/Office of Forestry, and the Louisiana Dept. of Health and Hospitals/Office of Public Health. **Interagency contracts** have been let to facilitate the execution of specific tasks. **Memoranda of agreement** have been drafted to spell out specific responsibilities for the respective entities as listed in volume 2.

B. PUBLIC PARTICIPATION

Public participation has been valued throughout the development of the Coastal Nonpoint Pollution Control Program. Multiple involvement opportunities, at various stages of program development have been afforded the public, allowing them to review and otherwise participate in the compilation of the program document information. A chronological listing of the opportunities afforded the general public is discussed below.

PROMOTING PUBLIC PARTICIPATION: EFFORTS TO DATE

During the formation of the Coastal Nonpoint Interagency Committee representatives of the public were invited to participate, and invited to sit on the subcommittees subsequently formed. At each interagency committee and subcommittee meeting discussion arose on the need to add new members, and this was carried out per the committee members' wishes. Several members of the general public have been added during the course of the development process.

The development of the CNPCP has been tracked by **updates in various monthly and bi-monthly bulletins and newsletters**, including publications financed by LDNR, LDEQ, LCES and LDHH. Contacts for more information were given in each article, and the public was invited to participate in the program's development. **Presentations by the CNPCP staff** made at seminars, conferences, workshops, and other public meetings, have emphasized the role that the public can and should play in the development process. In addition, contracts between LDNR and LDEQ, LDAF, LDHH, LDOTD, LCES, and LSU Sea Grant Legal have included development of elements of public education/outreach programs to assist CMD in keeping Louisiana's citizens informed about the program, its implications, and impacts.

In May of 1994 a series of four **regional public education/outreach meetings** were held throughout the coastal zone to inform the public about the program and to solicit comments and

encourage participation. Notices for those meetings were published in the local newspapers and journals, and the LCES (Cooperative Extension Service) agents informed their constituency through word-of-mouth and agency newsletters. Another series of meetings will be held in the fall of 1995 but will be aimed more at industry and user groups.

Public education/outreach materials developed for the CNPCP have included a **series of pamphlets** on each of the five sources of nonpoint pollution to be addressed in the program document, and a **poster** illustrating the sources of nonpoint pollution. The same contractor has **compiled a slide show** on the components of the CNPCP and the management measures and BMP's required to be discussed in the final program.

LOOKING AHEAD

In the fall of 1995 another series of pamphlets will be designed by LCES aimed at specific resource user groups and industry sectors. These pamphlets will link management measures with Best Management Practices (BMPs) that our citizens can put into effect. The LCES will also design a nonpoint logo and a new poster and will develop a 15 minute **videocassette** on the CNPCP and its implications. All of these existing and future education program elements have been and will continue to be exhibited at general meetings, conferences, seminars, environmental organization get-togethers, advisory committee meetings, and user group functions, in efforts to inform the public about the development and implementation of the program. In addition many of the Memoranda of Agreement expected to be signed between various state and federal agencies involved with this program, have public education/outreach components intended to reach resource users associated with particular agencies. Funding for all existing and future contracts concerning public education and outreach programs will continue to be a priority item in the 6217 budget.

Finally, in June of 1995 the CNPCP will hold a series of four regional meetings to **solicit public comments on the program document**. Notice of these meetings will be published in the local and state journals. All comments will be made part of the record and will be considered in the final program submitted.

Much remains to be done, in terms of making the people of Louisiana aware of this program. In the coming months, the LDNR/CMD staff expects to pursue the outreach efforts already initiated, and to consult further with advisors from LDEQ, LCES, and all other concerned entities, to evaluate how best to expand this part of the program.

C. ADMINISTRATIVE COORDINATION

During the development of the CNPCP program document many federal, state and local agencies assisted LDNR/CMD in completing the tasks at hand. The Coastal Nonpoint Interagency Committee and its five subcommittees consisted of the following agencies and/or organizations.

<u>FEDERAL</u>	<u>STATE</u>	<u>LOCAL</u>
EPA-Region VI	LDNR	Lake Pontchartrain Basin Foundation
NOAA	LDEQ	Louisiana Landowners Assn.
USDA/CFSA	LCES	Louisiana Land & Exploration
USDA/NRCS	LDHH	Georgia Pacific
USFWS	LDOTD	Bayou Lafourche Fresh Water Dist.
USACOE	LDAF	Vermilion Corporation
NMFS	La. Farm Bureau Federation	
USDA	LCRT	Citizens for A Clean Tangipahoa
BTNEP	LSU Wetland Resources	Mariner's Village Marina
U.S. Forest Service	LDWF	Vermilion Rice Growers Assn.
U.S. Geological Survey	La. Forestry Assn.	Boise Cascade
	LSU Biological & Agric. Engineering Dept.	Continental Land & Fur
	Louisiana Cattleman's Assn.	All approved local parish programs
	LSU Sea Grant	

The mission, structure and operation of these and all other relevant agencies and/or organizations as applying to the CNPCP are described in Section II, as well as the role they will play both in the development and implementation of this nonpoint program. The CNPCP will incorporate

approximately sixteen Memoranda of Agreement (MOAs) as part of the program document, each spelling out specific responsibilities acknowledged by the agencies involved.

D. MONITORING

Throughout the development of the CNPCP questions on monitoring have frequently been raised. During the next twelve months the CNPCP staff, in coordination the interagency committee and its subcommittees, will develop a detailed monitoring plan designed to document the implementation of Best Management Practices (BMPs) within the 6217 management area in order to improve water quality.

The monitoring plan to be developed will rely on the cooperation of the state and federal agencies that have the legal responsibility for designated subject areas of environmental protection. Louisiana intends to build upon existing oversight authority, coordinating with the agencies having enforcement responsibility for existing state and local statutes, laws and regulations. Any monitoring for water quality status or trends would be tied in to existing networks of the Louisiana Department of Environmental Quality, supplemented by the pesticide monitoring network of the Louisiana Department of Agriculture and Forestry, and water sampling programs of the United States Geological Survey, and the Louisiana Department of Health and Hospitals.

Coordination will be facilitated by responsibilities spelled out in Memoranda Of Agreement (MOAs) to be signed by sixteen state and federal agencies. At this time the LDNR/CMD anticipates negotiating MOAs with the following state agencies:

- Louisiana Department of Agriculture and Forestry for agriculture and forestry activities;
- Louisiana Department of Transportation and Development for roads, bridges, and highways on the state and federal systems in the hydromodification and urban sections;
- Louisiana Department of Wildlife and Fisheries for activities associated with state scenic streams and gravel pits;

Louisiana Department of Environmental Quality for many facets of the program, including urban runoff issues;

Louisiana Department of Health and Hospitals for individual sewage systems and shellfish beds; and

Louisiana Department of Culture, Recreation, and Tourism; Office of Conservation, Louisiana Dept. of Natural Resources; and Louisiana Cooperative Extension Service for incorporation of nonpoint pollution management measures into their programs.

The CNPCP through the LDNR/CMD staff will oversee and monitor marina activities as well as most of the hydromodification activities. All regulatory compliance actions will be through the CNPCP within LDNR and will be accomplished in coordination with federal, state and local law enforcement agencies. Federal agency MOAs will require that these agencies incorporate the concept of BMPs into their projects and special permit conditions.

The Coastal Management Division will build on its expertise learned through the existing coastal use permit procedures. The Louisiana Coastal Nonpoint Program Monitoring Plan will include sections on enforcement investigations, follow-up investigations, quarterly monitoring, and priorities for undertaking investigations. A permit investigation reporting form will be drafted to assure completeness and accuracy in compiling information. An enforcement reporting form will document investigations. A follow-up investigation reporting form allows CMD to determine the actions undertaken. Quarterly monitoring forms will summarize actions during the reporting period.

The CMD will coordinate with the state and federal agencies who have signed MOAs when developing forms that will provide CMD with the necessary data for reports to OCRM. For internal use, CMD will prepare a set of standard operating procedures for permit investigations, enforcement investigations, and other activities. The final section of the CMD Monitoring Plan will describe the coordination procedures with other state and federal agencies.

E. CRITICAL COASTAL AREAS

For *final* program approval Louisiana must ultimately identify and map critical coastal areas. The establishment of these critical coastal areas should focus on those areas in which new or substantially expanding land uses may cause or contribute to the impairment of coastal water quality. Such areas may require additional management measures to protect against current and anticipated nonpoint pollution problems.

Louisiana is not ready to identify any critical coastal areas at this stage in the program development. During the next twelve months the CNPCP intends to evaluate "critical coastal" areas, and solicit input from the agencies and the public on the land and water designations. How Louisiana intends to proceed to accomplish these tasks is discussed below.

To begin this effort, Louisiana will map "threatened or impaired" coastal waters. Impaired coastal waters means those waterbodies that are either not supporting one or more of the designated uses or that the waterbody only partially supports one or more of the uses and the remaining are fully supported (LDEQ 1993). Threatened coastal waters indicates that the waterbody fully supports its designated uses but that it may not fully support these uses in the future because of anticipated sources or adverse trends of pollution (LDEQ 1994). Impaired waterbodies are known by the Department of Environmental Quality and can be plotted by basin subsegment. At present, "threatened" coastal waters are not mapped by LDEQ. Thus the Louisiana program will initially direct its attention to *impaired* waterbodies.

Once the impaired waterbodies are mapped, Louisiana will identify those areas within the 6217 management area "...in which new or expanding land uses may cause or contribute to the impairment of coastal water quality." Primary land use categories for investigation include agriculture and urban development, subjects covered by pre-existing collections of data that can

be further sifted. For example, population census records (1950 to 1990) for incorporated areas and parishes provide statistics to document changes in urban and suburban use, and this information is largely available in digital format. Census of agriculture reports (1954 to 1994) provide information on total agricultural acreage by parish; the number and size of farms; harvested cropland by size of farm; woodlot acreage on farms, etc. Bulletins from the Southern Forest Experiment Station summarize the acreage of commercial forest by parish. Finally, the annual Louisiana Summary of Agriculture and Natural Resources gives detailed food and fiber commodity production statistics by parish.

Once the coastal land use patterns and trends are more clearly illuminated, Louisiana expects to map a critical coastal management zone, an appropriate distance inland of the critical coastal shoreline or edge of adjoining wetland. In accordance with NOAA/EPA *Program Development and Approval Guidance*, Louisiana will consider several factors when establishing critical coastal areas:

- C the nature of the coastal water quality problem(s) caused by nonpoint sources;
- C the extent to which the nonpoint sources are located adjacent to the waterbodies as opposed to further inland;
- C the physical and biological characteristics of the adjacent lands that contribute to nonpoint pollution;
- C important biological features that should be included as a whole, such as wetlands;
- C the type(s), density and characteristics of the new or expanding land uses that are anticipated and their expected effect(s) on water quality; and
- C the extent to which the above effects can be prevented or reduced by implementation of (g) management measures and/or the additional management measures for land uses.

F. ADDITIONAL MANAGEMENT MEASURES

For *final* program approval, state coastal nonpoint programs must provide for the implementation of additional management measures where coastal water quality is impaired or threatened, even after the implementation of the management measures specified in the (g) guidance. These additional measures will apply both to existing land and water uses that are found to cause or contribute to water quality impairment and to new or substantially expanding land uses within critical coastal areas adjacent to impaired or threatened coastal waters. The only additional/alternative management measure Louisiana is currently proposing concerns dredging activities, as described in the Marina portion of Section IV. For any future additional management measures to be incorporated into the CNPCP plan, the State of Louisiana would follow the steps discussed below.

Louisiana continues to identify and map coastal waters that are not meeting water quality standards. These areas will be examined in the context of increases in pollution loading from any new or expanding sources. While this task will be an ongoing effort, a status report could be completed in the next 3-6 months, contingent upon data availability. Second, the program will identify land uses that individually or cumulatively threaten or cause water quality impairments in adjacent waters. This task could take another 3-6 months. Our third step will be to identify critical coastal areas, as discussed in Section IIIE. This task is projected to take approximately one year from time of submittal of the program document. While critical coastal areas are undergoing evaluation, the effects of implementing BMPs will be evaluated by CNPCP staff and associated agency including the interagency committee and subcommittee members. If implementation of the initially identified the BMPs appears to be inadequate for attaining water quality goals, then additional management measures, additional BMPs, and/or alternative implementatino strategies would be evaluated by committee and subcommittee members. These new measures would then be implemented and monitored within the specified time frames of the program.

G. TIME FRAMES FOR COMPLETING THE CNPCP

During the interim period between submittal of the program document and approval in January, 1996, the CNPCP staff will continue to work on the development of a more complete program document. LDNR/CMD contracts with LSU Sea Grant Legal to complete legislation required to implement the program, and Louisiana Cooperative Extension Service to design a logo, pamphlets, a poster, and to hold user group outreach workshops, will not be completed until December, 1995. Similarly, LDNR/CMD's contract with Rodney E. Emmer & Associates to facilitate coordination between the 6217 and 319 programs (i.e., LDNR and LDEQ) will be extended to December 31, 1995. Finally, contracts with the Departments of Health and Hospitals, and Agriculture and Forestry will be extended through December 31, 1995 to allow sufficient time to more fully develop the monitoring forms they will utilize in evaluating Best Management Practice (BMP) implementation.

The CNPCP interagency committee and subcommittees will continue to meet, enabling review and discussion of input received at the public comment period of June/July, 1995. They are also expected to review and discuss the remaining portions of the program that need to be advanced, including expansion of public outreach and technical assistance, working out monitoring strategies, and designation of critical coastal areas. Public participation and administrative coordination will be further developed through the remainder of the program development and implementation stages. The projected time frame for completing the remaining portions of the CNPCP are given below.

SOME OF THE PROJECTED MILESTONES:

- Draft of expanded public outreach strategy -- September, 1995
- Draft of monitoring plan development strategy -- October, 1995
- Early report on critical coastal areas designation: data inventory, plan of action -- November, 1995
- Begin implementation of management measures for each source category -- January 1996
- Submit draft legislation to legislature -- March, 1997

CHAPTER IV

SOURCE CATEGORIES OF COASTAL NONPOINT POLLUTION

for the

LOUISIANA

COASTAL NONPOINT POLLUTION CONTROL PROGRAM

Coastal Management Division

Louisiana Department of Natural Resources

prepared in cooperation and coordination with

Office of Water Resources

Louisiana Department of Environmental Quality

July 1995

IVA. LOUISIANA

MANAGEMENT MEASURES FOR AGRICULTURE

Coastal Management Division

Louisiana Department

of

Natural Resources

*Louisiana's Coastal Nonpoint Pollution Control Program****AGRICULTURE*****I. INTRODUCTION**

Heavy rainfall in Louisiana rinses a variety of pollutants off the land, sending them into our coastal waters. These pollutants accumulate, threatening organisms ranging from shrimp and oysters, to redfish, brown pelicans and bald eagles. In order to reduce the delivery of polluted runoff water from the land to coastal waters, Louisiana's Coastal Nonpoint Pollution Control Program, coordinated between many agencies and advisors, will ultimately 1) identify Best Management Practices (BMPs) appropriate for all applicable pollutant source categories, and 2) carry out a initiatives of public education, technical assistance, and development of enforcement protocols in order to get BMPs implemented on the land.

Louisiana's Coastal Nonpoint Pollution Control Program will address the **AGRICULTURE SOURCE CATEGORY**, through all SEVEN management measure subcategories recommended by the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA). Louisiana is not proposing to exclude any management measures recommended by NOAA and EPA for this particular source category. The management measure subcategories that will be addressed in Louisiana's program are as follows:

1. (II.A) Erosion and Sediment Control
2. (II.B.1.) Confined Animal Facility, Small
3. (II.B.2.) Confined Animal Facility, Large
4. (II.C) Nutrient Management
5. (II.D.) Pesticide Management
6. (II.E.) Grazing Management
7. (II.F.) Irrigation Management

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APPLICABILITY of each of the seven management measures must be considered carefully and thoughtfully, with the understanding that some of the measures are only applicable to South Louisiana in a very limited sense. The management measure for **Erosion and Sediment Control** is broadly applicable to Louisiana agriculture, although all BMPs associated with that measure will not apply to all farms. The management measure for **Confined Animal Facility, Small**, is of very limited applicability because of the limited number and limited geographical distribution of any such facilities. The same restriction applies to the management measure for **Confined Animal Facility, Large**. The measure for **Nutrient Management** is broadly applicable to Louisiana agriculture, although all BMPs associated with that measure will not apply to all farms. The management measure for **Pesticide Management** is broadly applicable to Louisiana agriculture, although all BMPs associated with that measure will not apply to all farms. The measure **Grazing Management** must be applied very cautiously, as some of the associated BMPs are only applicable to managed pasture, and are not appropriate for open range or marsh fringe areas. The measure for **Irrigation Management** can only be applied in a limited sense, as a portion of South Louisiana's land is used for the production of leveed and flooded rice, but little other crop land could be considered "irrigated" as the term is understood in other areas of the country.

ADMINISTRATIVE COORDINATION for agriculture is expected to be coordinated between the Louisiana Department of Natural Resources, and the Louisiana Department of Agriculture and Forestry, along with the Louisiana Department of Environmental Quality, and other entities (see section IIIC).

TECHNICAL ASSISTANCE for agriculture will continue to be provided by a team of agencies featuring the Louisiana Cooperative Extension Service, and the Natural Resource Conservation Service, but also including the Louisiana Department of Agriculture and Forestry, the Louisiana Department of Environmental Quality, the Consolidated Farm Services Agency, and others (see section IIIA).

MONITORING for compliance with BMP implementation is expected to be led by the Louisiana Department of Agriculture and Forestry. **MONITORING** of water quality will be led by the Louisiana Department of Environmental Quality, supplemented by the pesticide monitoring network of the Louisiana Department of Agriculture and Forestry, water sampling programs of the United States Geological Survey, and the Louisiana Department of Health and Hospitals (IHID).

Best Management Practices (BMPs) for Agriculture for the LA Coastal Nonpoint Pollution Control Program

In Louisiana, **agriculture** is one of several land use categories generating nonpoint source pollution, *some* of which can be expected to reach coastal waters. In recognition of this, a cross-section of Louisiana's agricultural community has invested considerable time and effort in coordinating with governmental agencies to begin to identify effective and appropriate Best Management Practices (BMPs) for Louisiana, and to implement voluntary programs to reduce nonpoint source pollution. This is an ongoing process. Much work has been done thus far under the leadership of the Louisiana State University Agricultural Center toward identifying BMPs by commodity or livestock enterprise. The Best Management Practices Review and Development Program is a multi-agency program created in 1991 to evaluate the use of BMPs as a vehicle for environmental improvement on agricultural and forest lands. The program was conceptualized to be statewide, watershed based, and using site specific approaches for BMP applications. The BMP Review and Development Program was intended to help achieve voluntary producer implementation of economically achievable, effective BMPs, statewide. To date, BMPs associated with production of cotton, dairy, rice, sugarcane, feed grains, poultry production, and soybeans have been evaluated with written reports produced. BMPs pertaining to forestry production have also been evaluated and compiled by the Louisiana Forestry Association (LFA) in association with the Louisiana Office of Forestry (LOF) and the Louisiana Cooperative Extension Service (LCES). However, some words of caution are in order here.

1. While the BMP review committees have addressed the *major* crop commodities and agricultural enterprises present in South Louisiana, there are reviews of others yet to be completed. Work has continued during the second half of calendar year 1994 and the first half of 1995 on the "second phase" commodities and enterprises such as sweet potatoes, ornamental nurseries, swine production, commercial vegetables, aquaculture, and agricultural and seafood processing. Of these, only the last three are particularly relevant to coastal Louisiana.

2. While the review committees made qualitative judgements evaluating BMPs on pre-existing lists, many other BMPs not examined by this group are in use now, or are emerging as recent innovations, and the evaluators did not want to exclude additional worthy BMPs from consideration. Louisiana's agriculture community members do not want to draw up a list of "endorsed BMPs" that would leave out many other good practices that may be highly effective and imminently practical in many situations.

3. While the statewide review committees utilized BMP lists that included the 6217(g) coastal guidelines, questions have been raised as to what extent these committee members realized that the BMPs they highlighted or ranked for general purposes, could potentially be institutionalized and enforced as state law for specific programs such as the CNPCP. Louisiana wants to foster communication between all involved parties, to increase the understanding of what is needed for the CNPCP program, and to reduce the chances that someone might feel his/her work was misapplied or misrepresented in any way.

4. The review committees were organized by commodity, but the 6217(g) guidance is organized by "management measure" or by problem issue subcategory. It is anticipated that the committees will regroup accordingly and reconvene in the coming months.

Characterizing Agriculture in South Louisiana

To better understand the place of agriculture in the protection of Louisiana's coastal waters, it is essential to grasp an important distinction. Firstly, in the state of Louisiana as a whole, agriculture is of critical importance to our economy and way of life. Agriculture contributed \$8 billion to Louisiana's economy in 1994, with \$3 billion in raw crop and livestock commodities, and another \$5 billion in value added from processing. While cotton plays a pivotal role in providing jobs and supporting the tax base in North Louisiana's East Carroll Parish, sugar cane plays a comparable role in sustaining a viable economy in South Louisiana's Assumption Parish. *A healthy appreciation for the agricultural community influences governmental decision-making across the entire state of Louisiana.*

However, in much of South Louisiana near our coastal waters, there is relatively little land capable of supporting crop cultivation or other intensive forms of agriculture. South Louisiana contains 40% of the coastal marshes of the contiguous United States. Projecting into low-lying wetlands are fingers of higher land, often remnants of natural levees left behind by shifts in the Mississippi River delta locations over thousands of years. High ground is the exception in South Louisiana. Local geography is dominated by flood plain, swamp and marsh. What that means is that well-drained land is not plentiful, and is valued at a premium. Any particular use of this land must pay its own way with substantial returns to investment, or otherwise be bought out by some competing land use. The fact that any agriculture at all remains in the eastern half of South Louisiana attests to the economic clout of the agricultural enterprises there. The major agricultural commodities produced in South Louisiana are **sugar cane, rice, dairy farming, and beef cattle**. Dairying, may be of greater impact than beef production, but dairying is geographically localized to the "Florida Parishes" north of Lake Pontchartrain.

Sugar cane is one of the highest value agricultural commodities in all of Louisiana. In 1993, the *state of Louisiana* harvested 360,000 acres of sugar cane, which increased to 383,000 in 1994. Although sugar cane is limited by climate to South Louisiana, sugar cane requires well-drained soils, and the majority of its farms are located outside of Louisiana's coastal zone (see map). Sugar is produced on relatively large tracts, with producers in the leading parish, Iberia, averaging 417 acres in cane per farm in 1993. Reports by the Louisiana Dept. of Agriculture and Forestry indicate that many Best Management Practices tend to be used on cane fields, but questions have been raised as to the applicability of putting tracts of this size into cover crops to span fallow periods. The Louisiana Dept. of Environmental Quality and the Barataria-Terrebonne National Estuary Program have set up both research and demonstration projects to promote sugar cane BMP implementation. Some preliminary findings of these projects seem to suggest that banded applications of pesticides can achieve reduced levels of pesticide usage, while maintaining adequate levels of control. A new cane variety was recently released by the experiment station with improved resistance to both insects and disease, and offering the hope of needing significantly less pesticide. Local representatives of the American Sugar Cane League have been among the most active citizens in providing input into the development of the Louisiana's CNPCP thus far.

Rice is the other major crop in South Louisiana. It was the fourth largest crop commodity in all of Louisiana in 1993 by value. The total *statewide* harvested acreage, 530,000, was divided between seven parishes of Southwest Louisiana (327,000 acres in that subregion; Vermilion largest parish with 90,700 acres); and over 20 parishes farther to the northeast, extending to the Arkansas state line. In 1994 LDEQ surveyed rice producers in the Bayou Queue de Tortue area regarding BMPs in use and found that producers intended to continue to utilize BMPs even without cost-sharing money. In addition to LDEQ activities in SW LA, nonregulatory programs in the area include the Operation Quackback Program, jointly sponsored by Louisiana Cooperative Extension Service, the Louisiana Farm Bureau Federation, and the Louisiana Rice Growers Association. This program

promotes the simple practice of holding water on rice fields over the winter months, providing supplementary habitat for migratory waterfowl, with a related increase in consumption of "red rice" weed seeds. Reduction of this weedy pest should translate into less herbicide needed in the spring. Additional conservation benefits of the practice are realized by allowing time for fine sediments to settle out, and protecting the soil surface from the erosive force of hard Louisiana rains with a cover of standing water.

Dairy farms constitute the most significant form of **Confined Animal Facility** in proximity to Louisiana's coastal zone. Dairy operations are found in watersheds tangent to Louisiana's coastal zone in three parishes: Livingston, St. Tammany, and Tangipahoa. While these parishes (along with Washington, and St. Helena Parishes) have almost 80% of all Louisiana's dairy farms, only a few of their dairy farms (three?) are located within the coastal zone. Since 1989, there has been a vigorous, voluntary dairy BMP implementation program in this area, involving multiple agencies and organizations. The effort has resulted in the installation of no-discharge lagoons to handle dairy wastes. The current results of the program indicate that in Tangipahoa Parish alone, where one-half of the area's dairies are located, 120 lagoons have been installed, and 45 lagoons are in the planning stage. When dairy closures are added to these numbers, 73% of the parish's 270 dairies currently have or are planning no-discharge lagoon installation for handling their wastes, or have ceased operation as a dairy farm. The adjoining parishes are also participating in the current BMP implementation program.

Beef cattle are raised all over Louisiana in small cow/calf farm herds, and in Southwest Louisiana in lower density open range conditions. **Concentrated Animal Facilities, in the form of feed lots, are virtually nonexistent in South Louisiana**¹ The statewide

¹ Louisiana's hot and humid climate is not conducive to stimulating animals' appetites for consuming large amounts of feed, and thus animals kept outdoors do not make the rapid rates of gain needed for economical fattening operations. Further, large shipments of live cattle and bulky feedstuffs are less economical to ship than refined product, so feedlots tend to locate nearer suppliers of feeder steers and cheap feed grain in the west and midwestern states. An exception is the state of North Carolina, with large hog (and turkey) operations.

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mean beef herd size was only 45 head in 1993. That figure jumps to 85 head in Cameron Parish, the largest parish in the state, by area, where the cow-to-person ratio is almost 4:1, however, those herds are *dispersed* over the corresponding larger areas, giving low densities of animals. This is an important distinction: **grazing management measures** designed for intensively managed pastures of the Eastern United States are of limited applicability to low animal density range conditions. Further, management measures designed for protecting well-defined water courses are not necessarily applicable to regions of high rainfall and flat topography where the borders of streams and wetlands are quite variable. Louisiana may need to break its grazing BMPs, currently under development, into separate subsets for "range" and "pasture." Some livestock raising BMPs are eligible for USDA (CFSA) cost-share money. Earthmoving for construction of cattle walks through the marshes is regulated by Coastal Use Permit from LDNR, and (404/401) permits from USACOE and LDEQ.

(put map here)

Truck produce (annual fruits and vegetables), and citrus fruit operations are similar to dairies in that a relatively small acreage is dedicated to these land uses for the state as a whole, yet much of what we have is concentrated geographically (Tangipahoa Parish, the southern half, and Plaquemines Parish). The annual fruits and vegetables, mainly **strawberries, peppers, cucumbers, and cabbage**, are raised in some proximity to coastal waters (ten to thirty miles from the brackish lakes Pontchartrain and Maurepas) and the intensity of inputs and polluted runoff potential from this clustering could be significant. However, the positive side of the clustering should be recognized, in terms of efficiencies in public outreach, demonstration, and technical assistance efforts. All of these efforts are supported by the LSU Agricultural Center's Hammond research station, dedicated to truck crops and horticulture. In 1993 all of Tangipahoa Parish had 250 producers of strawberries on 1000 acres, and 50 producers of bell peppers on 900 acres. The largest parish for citrus fruit orchards, Plaquemines, had 150 producers of citrus fruits, with a total area in production of only 510 acres. The Best Management Practice Review committee for commercial fruits and vegetables began a series of meetings in 1994, and a report of their findings is forthcoming.

Soybeans *were* more important in South Louisiana in the mid-and late-eighties than they are now. The \$7.50 per bushel beans of 1988 had fallen to \$5.50 in 1991 and acreages planted tend to correspond with these market trends (from 2.0 million acres statewide, down to 1.0 million acres). In addition, Louisiana soybean production has been subjected to increasing biological pressure by pests such as red crown rot, stem canker, and root knot nematodes. Soybeans have been grown on a variety of soils, which adds up to a menu of alternative land uses available to replace soybeans. Statewide, cotton, corn, and to a lesser extent, hay, have increased at the expense of soybeans. But in South and Central Louisiana, tracts of poorly-drained bottomland cleared for beans in the 1970s were prime sites to let revert back to non-agricultural vegetation when opportunities appeared with the Wetland Reserve Program, the Conservation Reserve Program, and the Forestry Incentive Program. In 1988 Vermilion/Cameron/Calcasieu Parishes combined to harvest 138,500 acres of soybeans for grain. In 1991 the three parish total was down to 7,200 acres. It rebounded somewhat to 52,400 acres in 1993, and fell to 37,000 acres in 1994.

II. EXISTING NPS PROGRAMS IN LOUISIANA: REGULATORY AND NONREGULATORY²

REGULATORY PROGRAMS

The Dept. of Environmental Quality's oversight authority over discharges into surface waters (402 program) is documented in Section 402 of the Clean Water Act. A discharge permit is required for any point source discharge into waters of the state. This includes discharge from dairy lagoons, non-irrigation agricultural lagoons, catfish, crawfish, and alligator farms, and from rice seed soaking operations. All other agricultural activities are exempt from Louisiana state water discharge permits. There is an anti-degradation provision in the regulations to not allow state waters to go below current designated use support levels. This provision can be used to bring violators into compliance. Whether this authority could be extended to irrigation tailwaters remains subject to interpretation.

² Louisiana has at least four programs with broad authority for more stringent regulation than has been exercised heretofore. These programs should not be dismissed lightly, for at least two reasons. Firstly, in virtually all times and places, and especially in the present political atmosphere, there is little corporate will to add additional laws and bureaucratic instruments; laws in place may constitute "gold mines" of regulatory resources that could be utilized to some significant positive effect. Secondly, better use of these existing regulatory powers can be coaxed out by 1) setting up memoranda of agreement that explicitly spell out agency actions to follow, and 2) funding targeted to enable these actions to occur. The four highlighted programs -- all with shortcomings, all with potential -- are the Soil and Water Conservation Districts, the Conservation Compliance provision linking USDA (CFSA) support programs, the Dept. of Environmental Quality's oversight authority over discharges into surface waters, and the Louisiana Natural and Scenic Rivers System. In addition there are regulatory entities such as the Louisiana Pesticide Commission, and the Louisiana Fertilizer Commission whose scope is much less broad, but whose authority is powerful over a narrower range of activities.

The Louisiana Natural and Scenic Rivers System

The Louisiana Natural and Scenic Rivers System is one of the nation's largest. It encompasses 51 streams or stream segments and is over 1,500 miles in length. There are nine Scenic Rivers within the present boundaries of the Louisiana Coastal Zone. The System was proposed in the late 1960's and was brought into existence in the early 1970's with the passage of the Louisiana Natural and Scenic Rivers Act (La.R.S.56:1840 et seq.). The Act established a regulatory program and empowered the Secretary of the Louisiana Department of Wildlife and Fisheries (LDWF) to administer the System through regulation and permits. This regulatory program prohibits the following activities on all designated Scenic Rivers: channelization; channel re-alignment; clearing and snagging; impoundments of any type; and commercial clear-cutting of timber within 100' of the low water mark. Activities which may have a direct, significant or ecological impact on the streams and would thus require a "Class B" permit includes the following: bridge, pipeline and powerline crossings; bulkheads, piers, docks and ramps; waste water discharges; and land development adjacent to the stream. Any other activity that may have a direct, significant, ecological impact on the stream **or its tributaries or distributaries** is subject to regulation by permit by the Department of Wildlife and Fisheries. Scenic Rivers permits require the evaluation of twelve criteria for issuance. These include the following: cultural associations; historical/archaeological artifacts; economic changes; wilderness/rural qualities; scenic/aesthetic values; recreational opportunities; ecological systems; fish and other aquatic life; wildlife species; botanical elements; geological/hydrological features; and water quality/quantity.

The Scenic Rivers System Permit is issued by the LDWF with a multi-agency review by the LDWF, Office of State Planning and Budget, Louisiana Department of Environmental Quality (LDEQ), and the Louisiana Department of Agriculture and Forestry (LDAF). All permit applications are reviewed on a case-by-case basis, and most involve on-site inspections of the project area. The monitoring and enforcement of the permits will be

handled by LDWF agents through site investigations and inspections, surveillance and citizen complaints. Enforceable policies and mechanisms for this program include criminal penalties with fines and civil penalties with fines and adjudication. Penalties include: up to \$1,000 fines for each violation; suspension, annulment, withdrawal or revocation of the permit; institution of civil proceedings in district court; and issuance of cease and desist orders, compliance orders, injunctions or other appropriate relief. The program currently issues 15-20 permits per year.

The LDNR is discussing a Memorandum of Agreement with LDWF to oversee implementation of certain provisions of the CNPCP, to monitor and educate staff, contacts, and permittees on the provisions of the program, and to report noncompliance to the LDNR on at least a quarterly basis. The LDWF may incorporate said provisions as special conditions to their Scenic Rivers Permits and other projects until such time as these nonpoint pollution abatement measures become standard permit conditions.

The Louisiana Natural and Scenic Rivers System Permit in conjunction with the Louisiana Scenic Rivers Act provide some enforceable policies for the 6217(g) management measures. It requires scenic stream management plans (MM 2 II.C.); it requires permits for "waste water discharges" (MM 2 II.B., C., and F.) and its permit evaluation process would give strong consideration to most of the BMPs recommended in MM 2 II. A for **Erosion and Sedimentation Control**, and in MM 2 II.D. for **Pesticide Management**.

Louisiana Department of Natural Resources (LDNR) Coastal Use Permit Program

The Coastal Management Division (CMD) of the Louisiana Department of Natural Resources (LDNR) is charged with implementing the Louisiana Coastal Resources Program under authority of the Louisiana State and Local Coastal Resources Management Act of 1978 (Act 361, La.R.S.49:214.21). Under this authority, the Coastal Use Permit Program (CUPP) has been established by the CMD to help ensure the management and

reasonable use of the state's coastal wetlands. The CUP program carries the authority to enforce either legal or administrative procedures, including levying fines, issuing cease and desist orders, and requiring mitigation or restoration. The CMD Enforcement and Monitoring section monitors permitted activities in the coastal zone for compliance with permit conditions, and patrols by air, land, and water the entire coastal zone for unauthorized activities.

The CUP Program has oversight for land use activities in the designated coastal zone that involve dredging, fill, or other earth-moving or drainage impacting activities. Activities that may require a coastal use permit include dredge and fill projects, sewage treatment plant siting, waste-water discharge, drainage projects, pumping facilities, marsh management activities, water level control, levee construction, solid waste dump siting, roads and bridges, park siting, freshwater diversion, and mosquito control. Exempt from the program are silvicultural operations, as well as activities in leveed fastlands, in areas above the 5-foot contour interval, and on lands of federal jurisdiction. **Agricultural activities are excluded from the program where carried out in areas that traditionally have been used for agriculture.** The Louisiana Administrative Code 43 § 723 (B.7 a-b) reads:

Agriculture, forestry, and aquaculture activities on land consistently used in the past for such activities shall not require a coastal use permit provided that: The activity is located on lands or waters which have been used on an ongoing basis for such purposes, consistent with normal practices, prior to the effective date of the Act 361 of 1978; the activity does not require a permit from the U.S. Army Corps of Engineers and meets federal requirements for such exempted activities, and; the activity is not intended to, nor will it result in, changing the agricultural, forestry, or aquacultural use for which the land has been consistently used for in past to another use. The exemption includes but is not limited to normal agricultural, forestry, and aquacultural activities such as plowing; seeding; grazing; cultivating; insect control; fence building and repair; thinning; harvesting for the production of food, fiber, and forest products; maintenance and drainage of existing farm, stock, or fish ponds; digging of small drainage ditches; or maintenance of existing drainage ditches and farm or forest roads carried out in accordance with good management practices.

Presently subject to regulation by permit are construction of cattlewalks and excavation for new crawfish ponds, but there were no permit applications made for either of these categories during the past year of October 1993 to November 1994. Agriculture would be regulated under the CUP Program when the proposed land uses involve earth-moving in the coastal zone for new developments. The coastal management guidelines used to issue coastal use permits specify that "linear facilities," which includes roads, shall be planned using the best practical techniques to minimize disruption of natural hydrologic and sediment transport patterns, sheet flow and water quality (La. Admin. Code tit.43:I.705[I]), and thus would be most applicable to the management measure for **Erosion and Sediment Control**, management measure 2 II.A. While the program does not generally exert authority over agriculture in coastal Louisiana, there appears to be room in the wording of the code for a stricter interpretation, and extension of such authority to address other of the 6217 (g) management measures for agriculture.

LDAF Louisiana Pesticide Law and Applicator Certification Program

The Federal Insecticide, Fungicide and Rodenticide Act as amended in 1972 (FIFRA) requires individuals who apply restricted use pesticides to be certified applicators. Likewise, the Louisiana Pesticide Law (La.R.S.3:3201) states that: "No person shall apply or supervise the application of any restricted use pesticide as a private applicator unless that person has the proper certification."

This certification, for both commercial and private pesticide applicators, is necessary in order to buy, use, or supervise the use of restricted pesticides. Certification is issued after the applicant has satisfactorily passed an examination or has satisfactorily demonstrated knowledge of the laws, rules and regulations, and safety practices governing the sale and application of restricted use pesticides.

Examinations are given and certifications are issued by the Louisiana Department of Agriculture and Forestry (LDAF). The Louisiana Cooperative Extension Service (LCES), by cooperative agreement, is responsible for the training necessary to become a certified applicator. Workshops are conducted covering all aspects of pesticide use as delineated in 40CFR171. Applicators must be recertified every three years. The Louisiana Pesticide Applicator Certification Program addresses the 6217 (g) management measure for agriculture, 2 II.D., **Pesticide Management**.

U.S. Army Corps of Engineers 404 Permit Program

The Department of the Army regulatory program is one of the oldest in the federal government. The legislative origins of the program are the Rivers and Harbors Acts of 1890 (superseded) and 1899 (33 U.S.C.401 *et seq.*). Various sections establish permit requirements to prevent unauthorized obstruction or alteration of any navigable water of the United States.

In 1972, amendments to the Federal Water Pollution Control Act added what is commonly called Section 404 authority (33 U.S.C.1344) to the program. The Secretary of the Army, acting through the Chief of Engineers, is authorized to issue permits, after notice and opportunity for public hearings, for the discharge of dredged or fill material into waters of the United States at specified disposal sites. Selection of such sites must be in accordance with guidelines developed by the Environmental Protection Agency in conjunction with the Secretary of the Army. These guidelines are known as the 404 (b) (1) Guidelines. The Federal Water Pollution Control Act was further amended in 1977 and given the common name of "Clean Water Act."

Section 10 (33 U.S.C.403) contains the most frequently exercised authority in the Rivers and Harbors Act. Section 10 covers construction, excavation, or deposition of materials in, over, or under navigable waters, or any work which would affect the course, location, condition, or capacity of those waters. Navigable waters in the River and Harbors Act of 1899 are defined (33 CFR 329) as, "those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce."

The Clean Water Act uses the term "navigable waters" which is defined (Section 502 [7]) as "waters of the United States, including the territorial seas." Section 404 jurisdiction then is defined as encompassing Section 10 waters plus their tributaries and adjacent wetlands and isolated waters where the use, degradation or destruction of such waters could affect interstate or foreign commerce.

The discharge of dredged or fill material into waters of the United States requires a Section 404 permit. This includes return water from dredged material disposed on the upland and generally any fill material (e.g., rock, sand, dirt) used to construct fast land for site development, roadways, or erosion protection.

Normal farming, silviculture, and ranching activities such as plowing, seeding, cultivating, minor drainage, harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices are exempt under the 404 permitting process [CWA, Sec404 (f) (1)]. However, agricultural activities in designated wetland areas require a federal permit. Nonpoint source agricultural activities related to road construction may involve point source discharges of dredged or fill material and also may require a Section 404 permit{LAC tit.33:IX.301(M)(2)(a)}.

The federal 404 permit requires a 401 Water Quality Certification issued by the Louisiana Department of Environmental Quality (LDEQ). This is a regulatory program

administered by the state of Louisiana. The 401 Water Quality Certification's recommendations are incorporated into the Section 404 permit, and is then monitored through the USACOE's federal program as conditions of the federal permit.

The CWA Section 404 permit also requires that in addition to applying the state's approved Best Management Practices to the permitted activity, fifteen baseline provisions mandated by the USACOE must also be implemented.

USFWS Endangered Species Act/Critical Habitat Identification

The Endangered Species Act was enacted in 1973 to provide a means whereby the ecosystems upon which endangered species and threatened species depend would be conserved and also to provide a program for the conservation of such endangered species and threatened species. The Act is regulatory, nationwide in scope, and provides protective regulations for threatened species; recovery plans for the conservation and survival of endangered and threatened species; and includes penalty and enforcement provisions for violations of the Act. The U.S. Fish and Wildlife Service implements and has oversight for the Endangered Species Act in Louisiana.

Provisions of the Endangered Species Act relates to the following 6217(g) management measures and their components: 2 II.A.u."wetland and riparian zone protection," and 2 II. D. on pesticides, by providing an enforceable mechanism to provide protection for threatened or endangered aquatic species habitat areas.

Worker Protection Standard for Agricultural Pesticides

The new Worker Protection Standard for Agricultural Pesticides issued by the U.S. Environmental Protection Agency (EPA) consists of revised regulations intended to reduce the risk of pesticide poisonings and injuries among agricultural workers and

pesticide handlers through appropriate exposure reduction methods. These new regulations expand the requirements for issuing warnings about pesticide application, use of personal protective equipment, and restrictions on entry to treated areas. New requirements were added for decontamination, emergency assistance, maintaining contact with handlers of highly toxic pesticides, and pesticide safety training.

Agricultural workers, including those in forest related cultivation and harvesting tasks, and pesticide handlers are targeted by this new Worker Protection Standard. New WPS provisions are intended to: (1) eliminate exposure to pesticides, (2) mitigate exposures that occur, and (3) inform employees about the hazards of pesticides. The Louisiana Cooperative Extension Service (LCES) is involved in an extensive statewide outreach program to inform agricultural producers of what they must do to be in compliance with this program.

The 6217(g) management measure 2 II.D is addressed by this worker protection standard. It applies to agricultural workers and pesticide handlers who are involved in pesticide applications conducted as a part of normal agricultural activities. As stated, all workers involved in cultivation and harvest of plants in forests or those that handle agricultural pesticides are covered.

NONREGULATORY PROGRAMS

Lake Pontchartrain Basin Foundation

The primary goal of the Lake Pontchartrain Basin Foundation (LPBF) is to develop a comprehensive plan to clean up and restore water quality in the Pontchartrain Basin. This is to be done in cooperation with the U.S Environmental Protection Agency, with a grant for \$500,000. The LPBF is working with the local and state agencies to incorporate any existing legal or regulatory authority into the plan. The LPBF was founded under La

Legislative Act 716, and began operations in 1989. They are currently working with the NRCS and the dairy farmers north of the lake, on a plan to continue installation of no-discharge lagoons to reduce the amount of dairy waste entering the lake. This program started in March of 1993 and a number of farmers have signed up to participate. The LPBF has several ongoing projects for improving the lake's habitat that include constructed wetlands creation, freshwater diversion projects, and upgrading small municipal sewage systems north of the lake.

Louisiana Cooperative Extension Service (LCES) Public Education and Outreach Program

The Louisiana Cooperative Extension Service (LCES) Education and Outreach Program is a voluntary, nonregulatory education and outreach program created by the Smith-Lever Act of 1914. It is administered by the Louisiana State University Agricultural Center through parish outreach offices and is conducted in all parishes in Louisiana. These parish outreach offices are staffed by professional extension agents with expertise in agriculture, forestry, and natural resource conservation and management. Educational programs are developed and implemented in each local parish that address needs and issues deemed most important to the local constituency. This is accomplished in most parish Extension Service offices through the use of constituency based advisory committees.

Many effective educational and outreach techniques are utilized by LCES professionals to provide pertinent educational information to natural resource user groups. Educational services such as public meetings, workshops, seminars, field days, newsletters, publications, circular letters, newspaper articles, radio and television programs, method and result demonstrations, field visits and office contacts are offered at no cost and are available to everyone.

Supporting the LCES field staff are the state office specialists who help coordinate parish outreach activities. These specialists offer expertise in the areas of wetlands and coastal

resources, wildlife, forestry, water quality, environmental education, solid waste management, marine fisheries, aquaculture, agriculture and natural resources economics, agronomy, crop production, public policy, livestock production, youth education, home economics, and agriculture engineering.

An integral part of the LCES Outreach and Educational Program is the 4-H Youth education program in each parish. Operating through elementary and secondary schools, 80,000 students are exposed to issues and industries important to Louisiana.

Technical resources for the implementation of the LCES program are available through the numerous research stations located throughout the state. The continual agricultural and forestry research conducted on these stations provides the Extension agents with up-to-date research information that can be effectively passed along to producers, resource users and consumers.

The Louisiana Cooperative Extension Service serves as the educational arm of the United States Department of Agriculture (USDA) in Louisiana. The LCES Education and Outreach program utilizes the "teaching by doing" approach. They offer programs, demonstrations, and field visits keyed to the implementation of Best Management Practices to agricultural practices. All 6217 (g) management measures that apply are addressed by these BMPs.

Louisiana Cooperative Extension Service (LCES)/Louisiana Rice Growers Association/Louisiana Farm Bureau Federation Operation Quack Back Program

The Operation Quackback Program, is jointly sponsored by Louisiana Cooperative Extension Service, the Louisiana Farm Bureau Federation, and the Louisiana Rice Growers Association. This program promotes the simple practice of holding water on rice fields over the winter months, providing supplementary habitat for migratory waterfowl, with a related increase in consumption of "red rice" weed seeds. Reduction of

this weedy pest should translate into *less* herbicide (molinate, thiobencarb) needed in the spring. Additional conservation benefits come from standing water protecting the soil surface from the erosive force of hard Louisiana rains; and from holding turbid water, allowing time for the settling out of finer sediments. This small but growing program has most direct relevance to the management measures for **Erosion and Sediment Control**, and **Irrigation**, but also has some bearing on the measures for **Pesticide Management** and **Nutrient Management**.

Louisiana Department of Environmental Quality Nonpoint Source Management Program (319 Program)

Section 319 of the Clean Water Act (PL 100-4, Feb 4, 1987) was enacted to specifically address problems attributed to nonpoint sources of pollution. Its objective is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (Sec.101, PL 100-4). It introduces the Nonpoint Source Management Program (PL 100-4) which instructs the governor of each state to prepare and submit a Management Program for reduction and control of nonpoint source pollution from nonpoint sources into navigable water within the state by implementation of a four year management plan.

In response to this federal law, the state of Louisiana passed Revised Statute 30:2011, signed by the governor in 1987 as Act 272. This law directed the Louisiana Department of Environmental Quality (LDEQ), designated as the lead agency for the NPS program, to develop and implement a NPS Management Program. The NPS Management Program was developed to facilitate coordination with appropriate state agencies including, but not limited to, the Louisiana Department of Natural Resources (LDNR), the Louisiana Department of Wildlife and Fisheries (LDWF), the Louisiana Department of Agriculture and Forestry (LDAF) and the state Soil and Water Conservation Committee, in those areas pertaining to their respective jurisdictions.

The purpose of the Nonpoint Source Management Program is to describe the implementation strategy which the State of Louisiana has taken for implementation of the program. The management strategy is based on interagency cooperation and coordination of all state and federal agencies in Louisiana who have nonregulatory or regulatory programs which provide enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects that can be utilized to implement Best Management Practices (BMPs).

Agricultural activities make up one section of the NPS Management Program. Best Management Practices for agricultural enterprises have been developed in coordination with the LSU Agricultural Center (see previous discussion). These BMPs were designed to help prevent erosion of soil and runoff of nutrients and pesticides into surface waters of the state. The LDEQ is working with the LCES, LDAF, NRCS(SCS), and CFSA (ASCS) on a cooperative program directed at increasing implementation of BMPs on agricultural lands. The approach taken combines long-term educational programs and demonstration projects that provide information to the landowners and land managers on the types of water quality problems that result from agricultural activities, and what management practices are recommended for reduction and correction of the identified problems. While the 319 program has statewide responsibilities, conducting projects for the management of agricultural runoff in all parts of the state (e.g., Tensas River Basin in Northeastern LA), a substantial portion of its efforts are concentrated in or near coastal watersheds.

One such project of 1993/94 surveyed rice producers in the Bayou Queue de Tortue area of Southwestern Louisiana to get a better estimate of the extent of BMP implementation. Results indicated that "retention of flood water within a closed levee system after soil-disturbing activities," and "water planting in previous crop residue" projected to be two of the more utilized BMPs.

The LDEQ Nonpoint Source section is presently cooperating with LDAF, USDA/NRCS, LCES, Soil and Water Conservation Districts, the Barataria-Terrebonne National Estuary Program, and the Gulf of Mexico Program to implement a public outreach program, the Sugarcane Nutrient Management Program. It has also commissioned research into ways to more efficiently achieve sugar cane pest control, with reduced levels of chemical pesticides. Early results are promising, and related demonstration projects are underway to promote the dissemination of innovative practices.

LDEQ has been working in close cooperation with many of the above agencies to get dairy wastewater treatment lagoons in place in the largest dairy parish in Louisiana, Tangipahoa. The BMPs that are being implemented there match up well with the **Confined Animal Facility** wastewater guidelines in the 6217 (g) guidance manual, as NRCS (SCS) descriptions were relied upon in developing both programs.

As stated, the NPS Management Program actively implements BMPs within targeted watersheds through cooperative efforts and interagency agreements. The NPS program is a nonregulatory program and at present does not have enforceable policies. However, within the LDEQ agency is housed substantial enforcement authority for other environmental concerns, and the agency can exercise some discretion as to whether a particular problem is to be handled as a nonpoint source issue, or whether it is subject to regulation as a point source problem, a hazardous waste problem, and/or constitutes a degradation of the state's waters.

The NPS Management Program addresses all of the 6217 (g) guidance management measurements for agriculture. While much work remains to be done, this program can demonstrate tangible achievements in helping further the ultimate goals of the 6217 coastal program, the implementation of BMPs on the land.

Louisiana Natural Heritage Preservation and Land Acquisition Program (LDWF)

The Louisiana Natural Heritage Preservation and Land Acquisition Program (La.R.S. tit 56:1830) was created in 1987. The legislation states that within the Louisiana Department of Wildlife and Fisheries (LDWF), the Louisiana Natural Heritage Program is created to administer the provisions of law and rules and regulations regarding the Louisiana Natural Areas Registry, the Threatened and Endangered Species Conservation program, and those programs, duties, and functions designated by the secretary in accordance with law.

The Department of Wildlife and Fisheries is authorized to enter into agreements with national, nonprofit membership land conservation organizations to conduct programs, manage, preserve, and conserve land, and to purchase lands. The program is statewide and nonregulatory in nature. 6217(g) agriculture management measures are addressed under this program such as MM 2 II.A.u., "wetland and riparian zone protection."

LSU Agricultural Center Best Management Practices Review and Development Program

The people of Louisiana are presently in the process of identifying Best Management Practices (BMPs) for agriculture, statewide, but which are also applicable to the agriculture source category of the LA Coastal Nonpoint Pollution Control Program. Much work has been done thus far under the leadership of the Louisiana State University Agricultural Center toward identifying BMPs by commodity or livestock enterprise. The Best Management Practices Review and Development Program is a multi-agency program created in 1991 to evaluate the use of BMPs as a vehicle for environmental improvement on agricultural and forest lands. The BMP Review and Development Program was conceptualized to help achieve voluntary producer implementation of economically achievable, effective BMPs, statewide. The implementation was intended to be watershed based, and using site specific approaches for BMP applications.

To date, reports have been issued after review of BMPs associated with production of cotton, dairy, rice, sugarcane, feed grains, poultry, and soybeans. BMPs pertaining to forestry operations have also been evaluated and compiled by the Louisiana Office of Forestry (LOF) in cooperation with the Louisiana Forestry Association (LFA) and the Louisiana Cooperative Extension Service (LCES). Over the coming months, BMPs covering aquaculture, commercial vegetables and fruits, nurseries and ornamentals, sweet potatoes, swine production, and agricultural and seafood processing will continue to be reviewed and evaluated.

Louisiana's Stewardship Incentive Program (SIP)

The Forest Stewardship Program is a nationwide program designed to encourage and assist nonindustrial private landowners in more actively managing their forest resources, and can be extended to bring agricultural land into forest cover. Under the program, a Forest Stewardship **Management Plan** is prepared, specifically designed to enhance and manage all of the natural resources of the landowner's forestland. An important environmental benefit of this management plan is clean water production.

The Stewardship Incentives Program (SIP) offers financial assistance to landowners participating in the Forest Stewardship Program. SIP provides cost-share assistance to help the landowner establish the practices prescribed in the Forest Stewardship Management Plan. Eligibility for SIP requires nonindustrial landowners to own a minimum of ten forested acres, have the above mentioned management plan, and agree to maintain cost-shared practice for no less than ten years. There is an acreage limit of no more than 1,000 acres of nonindustrial private forestland per landowner but a waiver may be approved for this requirement.

Objectives of SIP include **reforestation** of non-stocked, under-stocked and eroding forestland; **habitat improvement for wildlife and fisheries**, promotion of Best Management Practices (BMPs) to maintain, enhance, and protect site productivity; and the protection of threatened and endangered species. In Louisiana the Stewardship Incentive Program is a statewide, nonregulatory program implemented by the Louisiana Office of Forestry (LOF) and the Natural Resource Conservation Service (formerly Soil Conservation Service, SCS). In its first year the SIP program enrolled 19 participants with over 2200 acres located in Louisiana's coastal zone and adjacent parishes.

The Forest Stewardship Management Plan required for participation in the Stewardship Incentives Program is a site specific plan and therefore addresses wholly or in part 6217 (g) management measures particular to the management situation. The plan considers long-term management of:

- 1) forest health,
- 2) fire hazard,
- 3) timber and wood products,
- 4) soil and water quality
- 5) riparian areas and wetlands,
- 6) wildlife and fish habitat,
- 7) outdoor recreation and aesthetics,
- 8) threatened and endangered species, and
- 9) cultural and historic areas.

Cost-sharing is available for certain SIP practices. These practices address specific (g) management measures. SIP Practice 2 is Reforestation and Afforestation. The purpose of this practice is to establish a stand of forest trees for conservation purposes and timber production and maintain newly established trees for a specified number of years. SIP Practice 5 is Soil and Water Protection and Improvement. The purpose of this practice is to maintain and improve water quality or forestland as well as soil productivity and prevent erosion on forestland. Specifically, these SIP practices address revegetation components of the (g) management measure 2 II.A. (**Erosion and Sediment Control**),

and 2.II.C., on developing farm conservation plans. SIP Practice 6 is Riparian and Wetland Protection and Improvement. The purpose of this practice is to protect, restore, and improve wetlands and riparian areas, reduce sedimentation, reduce streambank degradation, improve water quality and restore productivity. This practice is relevant to 6217 (g) management measure/practice 2 II.A.u."wetland and riparian zone protection."

Soil and Water Conservation Districts

Louisiana has established local soil and water conservation districts, the purpose of which is to protect and promote health, safety, and the general welfare of the people that have been endangered by improper land use practices (LA.R.S. Ann. 3: 1201 *et seq.*). The SWCD can enact supplementary local land use regulations as needed to carry out its charge. The SWCD mandate includes:

§1208. Powers of Districts and Supervisors

"(1) To carry out **preventive and control measures** and works of improvement for flood prevention or the conservation, development, utilization, and disposal of water within the district including, but not limited to, **engineering operations, methods of cultivation, the growing of vegetation, changes in use of land**, and the measures listed in R.S. 3:1201 (c), on lands owned or controlled by this state or any of its agencies, with the cooperation of the agency administering and having jurisdiction thereof, and on any other lands within the district upon obtaining the consent of the owner as well as occupants of such lands or the necessary rights or interests in such lands..."

USDA Conservation Compliance Provision of the Food Security Act of 1985

The Conservation Compliance provision of the 1985 "farm bill," the Food Security Act of 1985 (P.L. 99-198), seeks to protect environments particularly vulnerable to further agricultural development. This provision requires farmers with any lands designated as Highly Erodible Land, to develop and submit conservation management plans for these lands by January 1995. Inadvertent cultivation of these sensitive lands without benefit of conservation plan incurs monetary penalties, and willful or multiple violations leads to

disqualification from participation in most federal commodity support programs. Similarly, the wetlands conversion corollary of this provision penalizes new conversion of designated wetlands with disqualification from the support programs.

USDA Consolidated Farm Service Agency (CFSA, formerly Agricultural Stabilization and Conservation Service, ASCS) Agricultural Conservation Program

The Agricultural Conservation Program (ACP) is a national program available to all agricultural producers to implement practices designed to protect the soil and reduce the pollution of water, air, and land from agricultural or silvicultural nonpoint sources. Cost-sharing is available for planting trees and shrubs and improving timber stands for protection against wind and water erosion and to provide trees for timber production. In Louisiana, up to 50 percent cost-share may be provided to establish, regenerate, or improve forest stands.

The program is administered by the CFSA [formerly Agricultural Stabilization and Conservation Service (ASCS)], the Natural Resources Conservation Service (NRCS), [formerly Soil Conservation Service (SCS)], and the Louisiana Office of Forestry (LOF). The program was authorized in the Soil Conservation and Domestic Allotment Act, approved February 29, 1936, as amended. It is generally depicted as a nonregulatory program but under certain long-term agreements, producers must agree to maintain conservation practices for a specified number of years. Those who fail to do so are required to refund all or part of the Federal funds provided for installation of the practice. Since 1991, there has been an increase of 63 individual participants in the ACP with nearly 1,000 new acres being taken into the program in the Louisiana Coastal Zone and adjoining parishes.

The Agricultural Conservation Program addresses at least two of the 6217 (g) management measures. These measures include II.A. **Erosion and Sediment Control**, with provisions analogous to the (g) guidance BMPs a., g., k., l., and u.; and the **Nutrient Management Measure** (II.C.) calling for farm plans that include farm and field mapping, and identification of environmental field limitations (highly erodible lands, proximity to surface waters, etc.). Because each conservation plan would be site specific, different elements of the above management measures would be addressed by each plan.

USDA CFSA (formerly ASCS) Conservation Reserve Program (CRP)

The Conservation Reserve Program offers long-term rental payments and cost-share assistance to **establish permanent vegetative cover on cropland that is highly erodible or contributing to a serious water quality problem**. The program is authorized by the Food Security Act of 1985 (PL 99-198) as amended by the Food, Agriculture, Conservation, and Trade Act of 1990 (PL 101-624). A conservation plan must be developed and approved by the local conservation district for accepted acreage. In Louisiana the program is implemented by the Consolidated Farm Service Agency, (formerly Agricultural Stabilization and Conservation Service ASCS), the Natural Resources Conservation Service (NRCS), [formerly Soil Conservation Service (SCS)], and the Louisiana Office of Forestry (LOF). The CRP is generally categorized as a nonregulatory program but certain eligible conservation practices such as tree planting require "useful life easements" in which the landowner receives rental payments but must maintain the conservation practice for the entire easement period.

As of 1994, over 144,000 acres in Louisiana have been contracted into the Conservation Reserve Program, with 79,000 of these acres being planted in trees. In Louisiana's Coastal Zone and adjacent parishes over 24,000 acres have been accepted into the program.

Conservation plans required by the CRP would address 6217 (g) management measures 2 II.A. **Erosion and Sediment Control**, with provisions analogous to the (g) guidance BMPs a., g., k., l., and u.; and 2 II.C., the **Nutrient Management Measure** calling for farm plans.

USDA CFSA (formerly ASCS) Water Bank Program (WBP)

The Water Bank Program applies to wetlands and is designed to conserve surface water; reduce runoff, soil, and wind erosion; contribute to flood control; improve water quality; and improve subsurface moisture. It was authorized by the Water Bank Act which was passed by Congress December 19, 1970, and amended January 2, 1980. The Water Bank Program is a cost-share, nonregulatory program in which landowners receive annual payments for conserving and protecting wetlands from practices which may destroy the character of the wetland.

Land eligible for the program must be privately owned inland fresh wetlands which are suitable for the nesting, breeding, or feeding of migratory waterfowl. In Louisiana the program is statewide and administered by the CFSA [formerly Agricultural Stabilization and Conservation Service (ASCS)] and the Natural Resources Conservation Service (NRCS), [formerly Soil Conservation Service (SCS)]. As of January 31, 1993, thirty-seven landowners have been admitted to the Water Bank Program in Louisiana's Coastal Zone and adjacent parishes. A total of 15,739 wetland acres, not including an additional 1,458 adjacent acres, have qualified for admission into the program.

The WBP could address all the 6217(g) management measures in that the 10-year agreement entered into by the landowner with the CFSA (ASCS) requires the participating landowner to develop and follow a conservation plan which would prescribe specific forest practices to be conducted on the managed tract.

USDA CFSA (formerly ASCS) Wetland Reserve Program (WRP)

The Food Security Act of 1985 (P.L. 99-198) as amended by the Food, Agriculture, conservation, and Trade Act of 1990 (P.L. 101-624) authorized the Wetlands Reserve Program (WRP). The WRP is a voluntary, cost-share program to aid landowners in restoring and protecting wetlands. The **restoration of wetland hydrology and vegetation** will restore the functions and values of wetlands for migratory birds and other wildlife habitat and improve water quality. To participate in the WRP, landowners must grant a **permanent easement** to the United States Department of Agriculture (USDA) ensuring protection of the wetland in return for a WRP payment.

A Wetland Reserve Plan of Operations (WRPO) will be developed for this easement by the Natural Resources Conservation Service (NRCS), [formerly Soil Conservation Service (SCS)], and the Fish and Wildlife Service (USFWS) which mandates practices to restore the functional values of the wetland. The easement area will be periodically inspected to ensure that it is properly managed and maintained as required in the WRPO. Violations of the easement may result in the owner being required to refund all or part of the payment made, with interest.

Louisiana's statewide program is implemented by the CFSA [formerly Agricultural Stabilization and Conservation Service (ASCS)], Natural Resources Conservation Service (NRCS), [formerly Soil Conservation Service (SCS)], the Fish and Wildlife Service (USFWS), Louisiana Cooperative Extension Service (LCES), Louisiana Office of Forestry (LOF), and Soil and Water Conservation Districts. Technical services are provided by the NRCS, USFWS, and LOF.

The first Wetland Reserve Program sign-up held in 1992 resulted in 37 easements being filed from thirteen parishes. This amounted to 11,356 easement acres being included in

the program. Of this total, 915 acres was in the Louisiana Coastal Zone and adjacent parishes. Tentative data indicate that the second (1994) sign-up resulted in seven LA parishes enrolling approximately 11,986 acres.

As stated earlier, the Wetlands Reserve Program, as with the other Federal cost-share programs mentioned, **requires a workable land management plan**. Depending on site specific conditions, this program could address all 6217 (g) management measures. Especially pertinent would be management measures 2 II.A. **Erosion and Sediment Control**, and the **Nutrient Management Measure** (2 II.C.) calling for farm plans, as well as all management measures associated with (g) guidance chapter 7, "... Wetlands, Riparian Areas, and Vegetated Treatment Systems."

USDA FARM*A*SYST Program

The USDA FARM*A*SYST Program is a nonregulatory public outreach program sponsored jointly by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service), US Environmental Protection Agency, and administered within the state by the primary outreach agency for agriculture, the Louisiana Cooperative Extension Service. The program is designed to educate and to assess environmental risks on the farmstead and in other rural areas. It has particular relevance to 6217 management measures for responsible pesticide use in the environment (MM 2 II.D.), for livestock waste management (MM 2 II.B.1 and 2), and for "site evaluation - soils and geologic characteristics of the farm" (equates to MM 2 II.C.on farm and nutrient planning).

USDA Natural Resource Conservation Service (former Soil Conservation Service) Conservation Operations Program

The Conservation Operations Program comprises the day to day technical support activities carried out by the NRCS/SCS in assisting individuals and groups to manage soil and water resources of the land they use. The objectives of the NRCS (SCS)

Conservation Operations emphasize language such as "understanding soil and water problems and solutions," "sustainable use of soil and water resources," or "improving quality of the environment." This program is not limited to rural areas, but includes an objective to "provide proper land use and treatment of soil, water, and related plant and animal resources for all uses (farming, ranching, forestry, housing, recreation, transportation, public facilities, and multiple uses)." A major part of the program includes assisting land users to formulate **conservation plans** for farms and other land holdings. This guidance is provided by the staff of the fifty-one field offices in Louisiana.

USDA Natural Resource Conservation Service (former Soil Conservation Service) Resource, Conservation and Development Program

The NRCS Resource, Conservation and Development Program (PL-74-46, as amended) targets multi-parish regions that are relatively less developed, and offers economic development incentive grants and technical guidance, linked to natural resource conservation. This linkage is emphasized in the RC&D program, as it is set up to both develop and to conserve resources; and to improve economic activity and standard of living while yet striving to "enhance the environment." A second prominent feature of this program is its long-range nature in providing guidance and support to local people in the RC&D region. In Louisiana there are now five of these designated regions, with the Capital RC&D Area including several parishes that are at least partly in the coastal zone (Assumption, Livingston, Tangipahoa, and St. Tammany), and the Imperial-Calcasieu RC&D area including coastal Cameron Parish, and Calcasieu Parish.

USDA Natural Resource Conservation Service (former Soil Conservation Service) Watershed Protection and Flood Prevention Program

Congress authorized the SCS (now the NRCS) to provide financial and technical assistance for "planning, designing, and installing works of improvement which are related to flood prevention, drainage, irrigation, sediment control, public water based fish and

wildlife recreation, and accelerated land treatment measures." These projects are based on the watershed concept, and are intended for small watersheds of 250,000 acres or less.

The projects are supported by the NRCS (formerly SCS), but carried out by local sponsors (drainage districts, levee boards, police juries, or soil and water conservation districts). Thus far 22 projects have been completed in Louisiana under this program.

The NRCS watershed planning specifically relates to the **Erosion and Sediment Control** Management Measure II.A. (agriculture Chapter 2, in the 6217 (g) *Guidance Specifying Management Measures*).

III. 6217(g) MANAGEMENT MEASURES FOR AGRICULTURE MATCHED WITH EXISTING FEDERAL AND STATE PROGRAMS

1) (II.A.) Erosion and Sediment Control Management Measure

LDWF Louisiana Natural and Scenic Rivers System
 Soil & Water Conservation Districts
 USDA CFSA (ASCS) Agriculture Conservation Program
 USDA CFSA (ASCS) Conservation Reserve Program
 USDA CFSA (ASCS) Water Bank Program
 USDA CFSA (ASCS) Water Quality Incentive Program
 USDA CFSA (ASCS) Wetlands Reserve Program
 LDEQ Water Quality Certification Program (401)
 LDEQ Nonpoint Source Program (319)
 Louisiana Cooperative Extension Service Public Outreach Programs
 Louisiana Cooperative Extension Service Operation Quackback Program
 LSU AG Center BMP Review Program
 USDA NRCS (SCS) Conservation Operations
 USDA NRCS (SCS) Resource Conservation & Development
 USDA NRCS (SCS) Watershed Programs

2) (II.B.1) Management Measure for Facility Wastewater and Runoff from Confined Animal Facility -- Large Units

LDEQ Permitting of Discharges into Surface Waters (402)
 LDWF Louisiana Natural and Scenic Rivers System
 Soil & Water Conservation Districts
 USDA CFSA (ASCS) Agriculture Conservation Program
 USDA CFSA (ASCS) Conservation Reserve Program
 USDA CFSA (ASCS) Water Bank Program
 USDA CFSA (ASCS) Water Quality Incentive Program
 USDA CFSA (ASCS) Wetlands Reserve Program
 LDEQ Water Quality Certification Program (401)
 LDEQ Nonpoint Source Program (319)
 LDHH Water Sampling Program
 Louisiana Cooperative Extension Service Public Outreach Programs
 LSU AG Center BMP Review Program
 USDA FARM*A*SYST Program
 USDA NRCS (SCS) Conservation Operations
 USDA NRCS (SCS) Resource Conservation & Development
 USDA NRCS (SCS) Watershed Programs

**3) (II.B.2) Management Measure for Facility Wastewater and Runoff from
Confined Animal Facility -- Small Units**

LDEQ Permitting of Discharges into Surface Waters
LDWF Louisiana Natural and Scenic Rivers System
Soil & Water Conservation Districts
USDA CFSA (ASCS) Agriculture Conservation Program
USDA(CFSA ASCS) Conservation Reserve Program
USDA CFSA (ASCS) Water Bank Program
USDA CFSA (ASCS) Water Quality Incentive Program
USDA CFSA (ASCS) Wetlands Reserve Program
LDEQ Water Quality Certification Program (401)
LDEQ Nonpoint Source Program (319)
LDHH Water Sampling Program
Louisiana Cooperative Extension Service Public Outreach Programs
LSU AG Center BMP Review Program
USDA FARM*A*SYST Program
USDA NRCS (SCS) Conservation Operations
USDA NRCS (SCS) Resource Conservation & Development
USDA NRCS (SCS) Watershed Programs

4) (II.C.) Nutrient Management Measure

LDAF - Fertilizer Law
LDEQ Permitting of Discharges into Surface Waters
LDWF Louisiana Natural and Scenic Rivers System
Soil & Water Conservation Districts
USDA CFSA (ASCS) Agriculture Conservation Program
USDA CFSA (ASCS) Conservation Reserve Program
USDA CFSA (ASCS) Water Bank Program
USDA CFSA (ASCS) Water Quality Incentive Program
USDA CFSA (ASCS) Wetlands Reserve Program
LDEQ Water Quality Certification Program (401)
LDEQ Nonpoint Source Program (319)
Louisiana Cooperative Extension Service Public Outreach Programs
LSU AG Center BMP Review Program
USDA FARM*A*SYST Program
USDA NRCS (SCS) Conservation Operations Program
USDA NRCS (SCS) Resource Conservation & Development
USDA NRCS (SCS) Watershed Programs

5) (II.D.) Pesticide Management Measure

LDAF Pesticide Program - Regulatory & Certification
 LDEQ Permitting of Discharges into Surface Waters
 LDWF Louisiana Natural and Scenic Rivers System
 Soil & Water Conservation Districts
 USDA CFSA (ASCS) Agriculture Conservation Program
 USDA CFSA (ASCS) Conservation Reserve Program
 USDA CFSA (ASCS) Water Bank Program
 USDA CFSA (ASCS) Water Quality Incentive Program
 USDA CFSA (ASCS) Wetlands Reserve Program
 USFWS Endangered Species Act/Critical Habitat mapping
 LDAF Habitat Spray Mapping
 LDEQ Water Quality Certification Program (401)
 LDEQ Wellhead Protection Program
 LDEQ Nonpoint Source Program (319)
 Louisiana Cooperative Extension Service Public Outreach Programs
 LSU AG Center BMP Review Program
 USDA FARM*A*SYST Program
 USDA NRCS (SCS) Conservation Operations
 USDA NRCS (SCS) Resource Conservation & Development
 USDA NRCS (SCS) Watershed Programs

6) (II.E.) Livestock Grazing Management Measure

LDEQ Permitting of Discharges into Surface Waters
 LDWF Louisiana Natural and Scenic Rivers System
 Soil & Water Conservation Districts
 USDA CFSA (ASCS) Agriculture Conservation Program
 USDA CFSA (ASCS) Conservation Reserve Program
 USDA CFSA (ASCS) Water Bank Program
 USDA CFSA (ASCS) Water Quality Incentive Program
 USDA CFSA (ASCS) Wetlands Reserve Program
 LDAF Prescribed Burning Program
 LDEQ Water Quality Certification Program (401)
 LDEQ Nonpoint Source Program (319)
 LDHH Water Sampling
 Louisiana Cooperative Extension Service Public Outreach Programs
 LSU AG Center BMP Review Program
 USDA NRCS (SCS) Conservation Operations
 USDA NRCS (SCS) Resource Conservation & Development
 USDA NRCS (SCS) Watershed Programs

7) (II.F.) Irrigation Management Measure

LDEQ Permitting of Discharges into Surface Waters
LDWF Louisiana Natural and Scenic Rivers System
Soil & Water Conservation Districts
USDA CFSA (ASCS) Agriculture Conservation Program
USDA CFSA (ASCS) Conservation Reserve Program
USDA CFSA (ASCS) Water Bank Program
USDA CFSA (ASCS) Water Quality Incentive Program
USDA CFSA (ASCS) Wetlands Reserve Program
LDEQ Water Quality Certification Program (401)
LDEQ Nonpoint Source Program (319)
Louisiana Cooperative Extension Service Public Outreach Programs
Louisiana Cooperative Extension Service Operation Quackback Program
LSU AG Center BMP Review Program
USDA NRCS (SCS) Conservation Operations
USDA NRCS (SCS) Resource Conservation & Development
USDA NRCS (SCS) Watershed Programs